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Older People's Appropriation of Computers and the Internet

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Abstract

This thesis looks at how older people integrate computers and the Internet into their everyday lives and make these technologies their own as part of their broader experience of ageing. The thesis starts by considering the limits of current 'deficit-driven' models of accessible design used in relation to older people and highlights a need to develop new approaches which can accommodate the adaptive and 'positive' capacities that emerge with advanced age. The approach subsequently developed provides a consideration of older people's situated and subjective experiences in relation to computer and Internet engagement as part of their adaptations to ageing. Qualitative and ethnographic data in the form of participant observations, contextual interviews and video-based observations are all used to examine the ways in which older users identify computers and the Internet as relevant and construct meaningful uses for them over time. Four case studies are used to explore the contextual and subjective determinants of these emerging psycho-socio-technical relationships over time and in different contexts. Through grounded analysis patterns are established in the data which outline persistent qualities of these emerging relationships in relation to ageing. A psycho-socio-technical process known as 'appropriation' is used to frame these adaptive relationships as they develop over time.

In contrast to existing models of accessibility this analysis shows computer and Internet appropriation to be driven primarily by positive adaptations to ageing rather than its deficits. Six 'core themes of relevance' are identified across the studies (social contact; acquiring knowledge; supporting independence; intergenerational connection; reminiscence and life review and creativity) which represent age-relevant motivations that can be used as the basis for accessible designs promoting appropriation. In addition appropriation is outlined as a cumulative developmental process with distinct phases over time. This provides a structure for supporting older people's appropriation of computers and the Internet whilst maintaining an emphasis on well-being. Finally this thesis contributes to understandings of contemporary ageing, offering insights into the potential for computers and the Internet to change the ageing experience in developed societies.

TABLE OF CONTENTS

OLDER PEOPLE’S APPROPRIATION OF COMPUTERS AND THE INTERNET	1
OLDER PEOPLE’S APPROPRIATION OF COMPUTERS AND THE INTERNET	2
Abstract	2
List of Tables and Illustrations	6
Acknowledgments	10
Author’s Declaration	11
 CHAPTER 1 - OLDER PEOPLE'S APPROPRIATION OF COMPUTERS AND THE INTERNET	 12
Introduction	12
 CHAPTER 2 – TECHNOLOGY AND AGEING	 20
Theories of Ageing	20
Ageing in the Context of Industrialised Societies	27
Ageing and Everyday Technology	28
Making Computers and the Internet Relevant and Meaningful to Older People	34
 CHAPTER 3 –APPROPRIATION	 36
Introduction	36
 CHAPTER 4 - METHODOLOGY	 50
Overarching Methodology	50
 CHAPTER 5 – THE NEWHAVEN STUDY	 65
Introduction	65
Background/Setting	66
Findings	67
Discussion	85
Summary	88

CHAPTER 6 –THE AGE CONCERN IT DROP-IN CENTRE	89
Introduction	89
Findings	93
Continuing Appropriation	106
Discussion	109
Summary	116
CHAPTER 7 - GERIATRIC1927 AND YOUTUBE.	117
Setting/Background	117
Part 1 - Early Learning of Computers and the Internet and Discovery of YouTube	121
Video Analysis 1 - Peter's First Eight Videos and Responses - an Overview	122
Part 2- Peter's Continuing Appropriation of YouTube	143
Video Analysis 2 – Three Years and Four Months of Peter's Video Making – an Overview	144
Summary	165
CHAPTER 8 - THE NINTENDO WII IN SHELTERED HOUSING	167
Setting / Background	167
Methods	170
Video 1: Initial Use	176
Video 2: After 6 months	180
Video 3: After 1 Year	185
Discussion	188
Summary	193
CHAPTER 9 - CHARACTERISING OLDER PEOPLE'S APPROPRIATION OF COMPUTERS AND THE INTERNET AS POSITIVE ADAPTATIONS TO AGEING	194
The Lens of Appropriation	194
Establishing Relevance, Benefits and Personal Meaning	195
Implications for Accessible Design	209

Summary	216
CHAPTER 10 – APPROPRIATION AS A PROCESS OF CHANGE: IMPLICATIONS FOR SUPPORT AND ACCESSIBLE DESIGN	218
Appropriation as a Process of Change	218
Implications for Support	232
Implications for Accessible Design	236
Summary	239
CHAPTER 11 – CONCLUSIONS AND FUTURE DIRECTIONS	240
Computer and Internet Appropriation as a Positive Adaptation to Ageing	240
Appropriation-Based Accessible Design for Older People	242
Appropriation-Based Support for Older Computer Users	242
The Changing Experience of Ageing	243
Limitations of the Research	244
Future Research	245
Concluding Remarks	246
REFERENCES	247
APPENDIX A	286
APPENDIX B	287
APPENDIX C	289
APPENDIX D	292
APPENDIX E	293
APPENDIX F	294
APPENDIX G	295
APPENDIX H	296

List of Tables and Illustrations

List of Tables

Table 1: Erikson's life stages

Table 2: Contextual variables of the four studies in the thesis

Table 3: Initial coding scheme for Age Concern study

Table 4: Example of initial coding from Age Concern study

Table 5: Example of initial coding from YouTube study

Table 6: Example of axial coding from Newhaven study

Table 7: Example of axial coding from extended YouTube study (genre analysis)

Table 8: Example of axial coding from extended YouTube study (multimodal content)

Table 9: Example of axial coding from Wii study (multimodal content)

Table 10: Characteristics of participants in the Newhaven study

Table 11: Characteristics of Attendees to Age Concern IT Drop-in Centre

Table 12: Summary of Peter's first eight videos: title, content description and responses.

Table 13: Initial coding scheme for comments made in response to early videos

Table 14: Coding scheme for personal and emotive comments made in response to videos

Table 15: Different genres used in Peter's videos

Table 16: Details of example video for 'test video' genre

Table 17: Details of example video for 'reminiscence and life history' genre

Table 18: Details of example video for 'reflections on modern life' genre

Table 19: Details of example video for 'promoting older people's involvement' genre

Table 20: Details of example video for 'personal reflections on everyday life' genre

Table 21: Details of example video for 'advice or educational content' genre

Table 22: Details of example video for 'filmed naturalistic events' genre

Table 23: Details of example video for 'readings or scripted performance' genre

Table 24: Details of example video for 'YouTube related' genre

Table 25: Information about Wii game playing session in Sheltered Home 1

Table 26: Information about Wii game playing session in Sheltered Home 2

Table 27: Information about Wii game playing session in Sheltered Home 3

Table 28: Themes of relevance mapped to applications used

List of Tables and Illustrations

Figure 1: Adult Internet Use (ONS, 2009)

Figure 2: The technology adoption life cycle (Rogers, 1995)

Figure 3: Two examples of Sylvia's designs

Figure 4: A postcard design by Sylvia (the middle picture relates to the transcript)

Figure 5: Appropriation Process Model from the Newhaven Study

Figure 6: The Age Concern IT Drop-in Centre

Figure 7: Definitions of purpose by Age Concern attendees at initial use

Figure 8: Illustration of older person using bifocals to read on screen text.

Figure 9: Notebook used in the Age Concern IT Drop-in Centre

Figure 10: Example of 'crossword clue' web searching at Age Concern IT Drop-in Centre

Figure 11: Appropriation Process Model from the Age Concern IT Drop-in Centre Study

Figure 12: Peter at home in the 'sanctuary' – the room where he does his YouTube video blogging

Figure 13: Categorisation of responses (see legend in table 12) to each of the eight videos

Figure 14: Distribution of different sub-categories of personal and emotive responses

Figure 15: Subjects suggested in viewer comments for Peter to discuss in his videos

Figure 16: Peter's video making figures from 5th August 2006 to 31st December 2009

Figure 17: Test videos over time

Figure 18: Reminiscence and life history videos over time

Figure 19: 'Reflections on modern life' videos over time

Figure 20: 'Promoting older people's involvement' videos over time

Figure 21: 'Personal reflections on everyday life' videos over time

Figure 22: 'Advice or educational content' videos

Figure 23: Videos of naturalistic events

Figure 24: 'Scripted performance' videos

Figure 25: 'YouTube-related' videos

Figure 26: Appropriation Process Model from Peter's YouTube Study

Figure 27: Screenshot from the 'Power Throws' version of the Wii bowling game showing semi-transparent Mii character

Figure 28: Wiimote showing main buttons used during Wii bowling games

Figure 29: Appropriation Process Model from the Wii Study

Figure 30: Ecological view of older people's access to computers and the Internet

Figure 31: Final Appropriation Process Model

Figure 32: Reconciling implicit and abstract understandings through use

Figure 33: Summary of full appropriation cycle showing supportive factors and obstacles

Figure 34: Comparison between TTM and appropriation model

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Author's Declaration

I declare that this thesis and the work presented in it are my own and have been generated by me as the result of my own original research between October 2006 and October 2010. Where I have consulted the published work of others, this is always clearly attributed and on occasions where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work.

None of the material in this thesis has been submitted in support of an application for another degree or qualification at this or any other university.

Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself. Parts of the work contained in the thesis have already been published. Chapter 6: Geriatric1927 is based on two previously published papers, one in the Universal Access in the Information Society journal and the other in Computers in Human Behavior. An earlier version of chapter 8: The Nintendo Wii in Sheltered Housing, is also due to be published as part of the conference proceedings for USAB 2010.

Signed:

Date:

Chapter 1 - Older People's Appropriation of Computers and the Internet

Introduction

Populations are ageing across the developed world (UN, 2007) and attention has recently turned to ways of maintaining a good quality of life for the growing number of people experiencing an extended old age in these countries (WHO, 2002). Computer-based technologies have great potential for supporting older people to maintain their independence and quality of life (Czaja, Guerrier, Nair and Landauer, 1993; Czaja, Charness, Fisk, Hertzog, Nair and Rogers, 2006). Unfortunately problems of access persist for prospective older computer users with the majority of them either choosing not to engage with them at all or struggling to realise the benefits of ownership. This raises serious concerns about them being excluded from the pragmatic and social benefits of a modern society so invested in information technology (Selwyn, 2004; EC, 2007). So far attempts at making computer-based technologies more *accessible* to older users have approached their use of them at a functional level, redesigning or adapting user interfaces to reconcile their declining physical and cognitive abilities with the design of interfaces (Stephanidis, 2001). Such approaches towards 'inclusive design' (e.g. Keates and Clarkson, 2004) or 'universal accessibility' (e.g. Stephanidis, 2001; Savidis and Stephanidis, 2006) have emerged as dominant paradigms within Human Computer Interaction (HCI) particularly in relation to web design (e.g. Kurniawan and Zaphiris, 2005; W3C, 2005) where UN conventions now recognise the significance of such an approach in reducing inequalities of online access (UN, 2005; pg.9). Such approaches to *functional* accessibility focus on the simplification of interfaces in line with age-specific disability, incorporating 'deficit-driven' models of ageing derived from physical (medical), cognitive and social theory. Whilst such approaches towards *functional* accessibility are important and significant in their own right, they struggle to address contextual issues (Kelly, Sloan, Brown, Seale, Petrie, Lauke and Ball, 2007) and the opportunities for ongoing positive development that remain in the everyday lives of older people and which might encourage greater adoption and sustained use amongst this age group. Existing research suggests that the biggest obstacle to older people adopting and using computers and the Internet more is that they do not see them as relevant (Selwyn, Gorard, Furlong, and Madden,

2003; Dickinson and Hill, 2007; Richardson, Weaver and Zorn, 2005) or beneficial (Sharit, Czaja, Perdomo and Lee, 2004; Melenhorst, Rogers and Caylor, 2001; Melenhorst, Rogers, and Bouwhuis, 2006; Department for Communities and Local Government, 2008a) underlining the importance of meaningful engagement over functional access. In this thesis a theoretical lens of 'appropriation' (e.g. Dourish, 2003; Salovaara, 2008) is used to explore older people's engagement with computers and the Internet in terms of the positive adaptations that make such engagements relevant, beneficial and meaningful enough to sustain their ongoing use.

Technology adoption (Rogers, 1995) and acceptance models (Bagozzi, Davis and Warshaw, 1992) have also been used to explain older people's initial reactions to computer-based technologies (e.g. Eastman and Iyer, 2004; Ryu, 2008) and they also deal with relevance and benefits in certain respects. However they are (like accessibility approaches) limited by their objective and rational stance towards the person-technology dynamic which relies on quantitative attitudinal surveys to analyse the space (e.g. Ahn, Beamish and Goss, 2008) and ignores the ongoing relationship with the technology. Such approaches struggle to account for issues of subjectivity and context which are central to understanding meaningful use of technology (Suchman, 1987; Dourish, 2004) and the adaptive aspects of ageing (e.g. Baltes and Baltes, 1990; Tornstam, 2005) that are likely to underpin that use. There is a need to understand the process by which these technologies come to be meaningful to older computer users through the establishment of their relevance and benefits within the context of everyday lives, not just as part of a rational decision making process that results in ownership of the device but as something that is actively constructed by older people as part of their lives.

In addressing issues of context in relation to technology use it is necessary to employ methods of an ethnographic nature where the researcher is placed at the centre of the context under study to reveal subjective modes of understanding (Dourish, 2006) where the relevance and meaning of computers and the Internet are constructed through users' interactions with them and their conversations with one another about their relevance. In this thesis just such an ethnographic approach is employed to examine older computer and Internet users in different social contexts relevant to the ageing experience.

Appropriation is often studied by conducting longitudinal case studies and then applying 'higher level' theoretical frameworks to account for the observed activities (Salovaara, 2008). This thesis also uses longitudinal studies but takes an inductive and grounded approach to examining appropriation, building a process model of change up from the

data. Appropriation exposes the underlying subjective and socially embedded nature of computer and Internet engagement for older people which frames their use as meaningful experience and potentially defines it as a positive adaptation to ageing concerns. In this way the negotiated process by which the relevance and benefits of computers and the Internet are established is examined. This thesis is also interested considers how older people *appropriate* computers and the Internet by fitting them within their broader experience of ageing. Using lifespan theories of psychosocial development to further contextualise the adaptations that are seen the positive aspects of ageing are emphasised. In particular appropriation is framed in terms of Erikson's (1959) stage theory of lifespan development; Baltes' (1993) theory of selectivity with optimisation and compensation; Carstensen's theory of socioemotional selectivity (1992) and Tornstam's theory of gerotranscendence (2005). Throughout the thesis important connections are made with these theories and other literature from psycho-social gerontology and this is an important contribution of the thesis.

The ultimate aim of this thesis is to add a subjective and contextual dimension to current notions of accessibility for older people which acknowledges the positive developmental opportunities that remain as part of advanced age. The principle research questions being addressed are: How do older people establish issues of relevance, benefits and personal meaning with regards to computers and the Internet as part of their everyday experience and how does this relate to developmental adaptations to ageing? What is the process by which computers and the Internet become integrated into older people's everyday lives? What effect does ongoing computer and Internet use have on further developmental adaptations to ageing?

In order to answer these questions the thesis pursues the following aims:

1. To characterise older people's emerging relationships with computers and the Internet to provide insights into their particular everyday, evolving and innovative uses of these technologies in relation to adaptive ageing.
2. To develop a process model of change based on the previous characterisation which can reframe notions of accessibility to inform design and support initiatives for older people using computers and the Internet.

The original idea for this PhD research grew out of an early interest in functional approaches to accessibility for older people. Initial involvement with older computer users showed a disparity in abilities and motivations amongst this user group and a difficulty in applying a 'broad brush' functional approach. Appropriation emerged from the literature

as a way of bridging these disparities, offering a means of understanding and empowering older users at a deeper psychosocial level. Underpinning this research is an approach to the person-technology dynamic that sees computer and Internet appropriation developing within older people's everyday lives through the reconciliation of individuals' own particular intentions with the design of the technology through using them and incorporating them into their lives over a period of time. As such appropriation does not subscribe to a generalisable view in the same way as functional accessibility but rather one which is idiosyncratic and intimately tied up with personal negotiations vis a vis the technology, taking place in the midst of an age-related psychosocial context. The purpose of computers and the Internet for older people is not assumed to be something that is predefined by its technical function or by a person's age but as an emergent aspect of the relationship between an older person and their technology, so in turn their notions of relevance, benefits and personal meaning. In seeking to identify such emergent properties, motivations and interpretations 'in use' this research has enlisted a participatory approach throughout, engaging users as much as possible in the interpretive process, revisiting data in a collaborative manner with participants along the way to ensure its phenomenological validity.

In characterising older people's appropriation of computers and the Internet it is important to address a number of different contexts and in a way that reflects different abilities and previous experience. Ethnographic data in the form of participant observations, contextual interviews, semi structured interviews, text and video-based conversational data and video recordings of use have all been used to identify the ways in which older users construct meaningful uses for computer and Internet use within their particular psychosocial contexts and how this changes over time. Four separate studies were undertaken with older people, conducted in distinct contexts and covering different degrees of independence with a view to identifying varying degrees of appropriation. One of these (the Newhaven study) was with a group living independently in the community; one took place in a public computer drop-in centre run by a local charity (the Age Concern Drop-In Study); one online with an older vlogger (Geriatric1927) and finally a study in sheltered housing (the Wii study). All the studies focused on issues relevant to appropriation and developed an understanding grounded in the lived experience of participants.

The key findings from these studies are that the relevance and benefits of computers and the Internet for older people are ongoing negotiated qualities of the person-technology dynamic which are determined not by the 'deficits' of ageing but by positive adaptations to

the ageing experience. Six core themes of relevance (social contact; intergenerational connection; reminiscence/life review; acquiring knowledge; maintaining independence and creativity) are identified which encapsulate older people's appropriation of computers and the Internet as positive adaptations to ageing. This contributes to an understanding of how older people actively construct their sense of meaningful engagement with these technologies in line with their broader experience of ageing. The core themes reveal constructions of meaning for computers and the Internet that typify relevant and beneficial use for this age group, suggesting areas that accessible design might explore to encourage their greater appropriation.

Another contribution of this thesis is a process model of change developed to show older people's appropriation of computers and the Internet and delineating specific phases for this cumulative development: 1) non-adoption; 2) growing awareness; 3) adoption; 4) reframing of purpose; 5) active learning; 6) development of computer-mediated presence and 7) deep engagement. The elaboration of this model has important implications for support initiatives aimed at older people's digital inclusion as well as approaches to accessible design for this age group. It also shows appropriation of computers and the Internet to have potential as a positive developmental opportunity for older people and as a framework for empowering older people in relation to future technology development.

Thesis Walkthrough

Chapter 2 looks at how different understandings of ageing have influenced approaches to technology design for older¹ users. In particular it considers the legacy of medical, social and cognitive theory in perpetuating a 'deficits' model for ageing within accessible design fields and the possibility of using alternative 'positive' design perspectives derived from developmental lifespan theory. The possibility of more contextually appropriate design is considered and appropriation is presented as a way of providing a more nuanced account of the relationship between technology and ageing which accommodates the positive adaptations highlighted by lifespan theories of development.

In chapter 3 *appropriation* is presented as a way of understanding the person-technology dynamic and as a suitable vehicle for exploring the adaptations to ageing that are played

¹ The definition of an elderly or 'older' person is dependent on the society in which that person lives (WHO, 2009). For the sake of this thesis it has been taken as retirement age in the UK which is currently 60 for women and 65 for men.

out through older people's use of computers and the Internet. Consideration is given to the different ways that appropriation has been applied in relation to the person-technology dynamic including appropriation as technology adoption, as design in use and as a psychosocial nexus. A working definition of appropriation is developed with reference to existing literature to be used throughout the thesis as a way of orienting investigation and analysis.

Chapter 4 describes the overarching methodology used outlining the qualitative, longitudinal and inductive approach taken, guided by grounded theory (Glaser and Strauss, 1967; Glaser, 2001) and employing research strategies derived from ethnography and ethnomethodology. Specific methodological and analytical decisions relating to each case study are explained giving examples of coding and justifications for sampling. Interpretive and ethical considerations are also discussed.

Chapter 5 (the Newhaven study) reports on a qualitative study undertaken with older people living in their own homes in the South East of England. Semi-structured interviews were undertaken to explore experiences of growing older in the UK and the role that computers and the Internet had played in the post retirement transition. The intention of this study was to elaborate upon the broad social context which influenced and informed these older people's appropriation of computers and the Internet, primarily the adoption phase. Five key themes of relevance were identified in relation to this group of older people which framed appropriation. These were: 1) formal sharing of information, 2) aid to intergenerational understanding, 3) supporting independence, 4) social contact and 5) creativity. However these did not necessarily translate into further appropriation with individual adaptations to age-related change emphasising some themes as benefits and others as deficits. Socioemotional selectivity (Carstensen, 1992) was shown to influence socially relevant uses for computers and the Internet. Three phases were identified for appropriation over time (rejection - adoption - deep engagement) with a difficulty in realising the benefits of use differentiating reluctant adoptees from committed ones.

Chapter 6 (the Age Concern Drop-In Centre Study) charts computer and Internet use by older people from initial encounters and beyond through a longitudinal participant observation study undertaken at a computer drop-in centre specifically catering for older people in Brighton, UK. Early analysis redefined the appropriation phases as: non-adoption - adoption - active learning - deep engagement. The study focused on the learning phase during and after adoption, exploring initial understandings of relevance and purpose as well as how actual use comes to influence the realisation of benefits and

further appropriation through encounters with new technological opportunities and obstacles during use. Similar themes of relevance were identified with an additional one of life review/reminiscence appearing. Relevance was shown to motivate and direct the learning of basic skills. Socioemotional selectivity (Carstensen, 1992) was again shown to influence the ongoing establishment of relevance and selectivity with optimisation and compensation (Baltes and Baltes, 1990) was evident in defining approaches to learning. There was also a strong element of implicit learning (Reber, 1989) taking place post adoption which emerged through experimental, trial and error use of functionality.

Chapter 7 (Geriatric1927's YouTube Study) focuses on the appropriation of the YouTube website by an 80 year old video blogger called Peter Oakley (Geriatric1927). This is a longitudinal case study following Peter over 3 years using online conversational data in both textual and video form and following this up with online and face to face interviews to explore the meaning that he attached to his use of YouTube. Overall Peter's appropriation has similar phases to the earlier studies, starting with him defining a sense of relevance at adoption that incorporates elements of intergenerational connection, social contact and creativity. However his active learning process was radically transformed by his creative engagement with an existing community of practice online, that of YouTube vloggers. His appropriation then became embedded in a socially meaningful activity which accelerated his learning. His engagement with YouTube was not driven by socioemotional selectivity (Carstensen, 1992) but showed an openness to new social contact (particularly with the younger generation) more reminiscent of gerotranscendence (Tornstam, 2005). His ongoing involvement in YouTube helped him to develop technical, social and performative skills and revealed to him new opportunities for social engagement and self expression. The development of a *computer-mediated presence* became an important aspect of Peter's appropriation which allowed him to explore new identities through the use of genre and to feel a sense of belonging to the YouTube community.

Chapter 8 (The Wii Study) focuses on the appropriation of Nintendo Wii gaming consoles in older people's sheltered housing schemes and shadows an Age Concern initiative which uses the consoles to promote physical and social activity in these settings across Brighton and Hove in the UK. It covers the whole appropriation cycle from adoption through to deep engagement but is different to the other studies in some important ways. The Wii initiative was a structured intervention influenced by particular philosophies on ageing perpetuated by the organizing bodies rather than being determined by the players themselves. Also the Wii console itself, whilst ostensibly a computer-based technology, was presented to users in a different form and context, framed as a device for social

entertainment. Despite these differences there were commonalities in terms of appropriation and the establishment of relevance and benefits. Social contact, intergenerational connection, maintaining independence and playfulness (a precursor to creativity) all figured in discussions of relevance with the Wii players. The active learning phase was again subject to implicit learning (Reber, 1989) processes and selectivity with optimisation and compensation (Baltes and Baltes, 1990) was also influential. Socioemotional selectivity (Carstensen, 1992) was absent. What did become clear in this study was the contested nature of these institutional settings and the way in which the Wii could empower older people living there to redefine these settings as community meeting places. Age Concern's involvement was pivotal in promoting further appropriation through defining decorum as a feature of Wii game play. This in turn empowered players to develop new social peer connections and a new community of practice around Wii playing that encouraged their ownership of the communal spaces in which they lived. At deep levels of engagement new roles emerged for players as hosts of communal Wii events and as instructors to new players. The altruistic sharing amongst established Wii players was reminiscent of gerotranscendence (Tornstam, 2005).

In chapter 9 the evidence from all four studies is considered, exploring the six common themes that framed appropriation throughout (social contact; intergenerational connection; reminiscence/life review; acquiring knowledge; maintaining independence and creativity) and which were central to resolving issues of relevance, benefits and personal meaning for the older users in this thesis in lieu of adaptations to ageing. The relationship of these themes to relevant lifespan theories of psychosocial development is explored in greater detail and the implications for accessible design and contemporary theories of ageing are discussed.

In Chapter 10 appropriation is described as a process of change model, differentiating phases over time. The implications of this model are then explored in terms of informing accessible design and support initiatives for older people using computers and the Internet as well as reframing notions of accessibility for them as a user group.

Chapter 11 concludes by summarising the main findings and arguments made throughout the thesis and considering possible future directions for research, highlighting the contribution of appropriation in this vein.

Chapter 2 – Technology and Ageing

Covered in this chapter:

This chapter looks at different perspectives on ageing and examines how they have influenced approaches to technology design for older users particularly in relation to accessibility. The difficulties associated with designing for older people are explored and the need for an alternative lens which can accommodate the full ageing experience is highlighted.

Theories of Ageing

Ageing is the process that accompanies the physical decline and deterioration of the body beyond full maturity. Ageing is experienced on a psychological as well as a physical level, particularly in relation to the decline of certain capacities such as memory and the ability to adapt to novel circumstances (Baltes and Baltes, 1990). Old age brings with it changes to self concept and social circumstances which may compound or ameliorate any negative effects upon a person's sense of well-being. There are many ways of approaching an understanding of ageing and the study of these different approaches sits within the broad umbrella of *gerontology*. Defining what is actually meant by 'old age' or an 'older person' is not necessarily straightforward with quite different academic understandings coming from gerontology and everyday definitions depending upon the society in which a person lives (WHO, 2009)

1. Perhaps the most prominent and influential of these is that defined by the bio-medical model which deals with the physical aspects of ageing, treating them as forms of progressive dysfunction or 'pathology'. As such it sees ageing as an inherent aspect of all biological organisms whereby increasing cellular changes through the lifespan increase susceptibility to physiological stress and ultimately death as the body ages. This underlying process, sometimes described as 'cellular senescence', is seen as partly pre-

¹ For the sake of this thesis it has been important to take on board definitions that are already present in the everyday experience of participants and which are likely to influence current models of accessibility and age-relevant services for this user group. Therefore the definition of an older person in this thesis is in line with the prevailing definition of old age in the UK, that is the chronological age at which a person becomes entitled to receive state pension benefits (Dunnell, 2008). At the start of the thesis this was 60 for women and 65 for men.

programmed into our DNA but also occurring as a result of increasingly error prone cell replication as we age (Briggs, 1993).

The observable counterpart to cellular senescence is the gradual deterioration of physiological functioning that is experienced with increasing age. Indeed it is this aspect of ageing that the biomedical model seeks to address through the proactive intervention of health care services. Specific physiological functions become less effective with increasing age, particularly the cardiovascular, respiratory and musculoskeletal systems (Bowling, 2005; Craik and Salthouse, 1992; Hayflick, 1994). Sensory decline becomes more common most noticeably in terms of sight and hearing but also in relation to the other senses of smell, taste and touch (Woodrow, 2002).

Accompanying these changes is a more general atrophying of the nervous system which results in slower perceptual and information processing speeds (Fisk and Warr, 1996; Kosnik, Winslow, Kline, Rasinski and Sekuler, 1988). Metabolic changes bring reduced activity levels and changes in appearance with a gradual reduction in height, often with weight loss due to reduced muscle and bone mass (Staehelin, 2005). Whilst no single one of these age-related changes is inevitable, physical limitation of some kind goes hand in hand with old age.

The curtailment of physical mobility that accompanies advanced age also has huge implications for social functioning. It affects how day to day relationships with others are managed; the roles that are available to older people within society as well as how society chooses to care for them. Social gerontologists have historically addressed this issue from a starkly functionalist perspective, seeking to reorient the perceived social problem through social initiatives. Initial theories focussed on the processes of social disengagement that were evident in the elderly population. Activity theory² (Cavan, Burgess, Havighurst and Goldhamer, 1949; Havighurst and Albrecht, 1953) for instance saw individual well-being as intrinsically linked to ongoing participation in social roles and sought to engage older people in social activity beyond retirement. Conversely disengagement theory (Cumming and Henry, 1961) suggested that increasing social withdrawal with age was a natural and healthy aspect of ageing for both the individual and society, implying that interrupting this process (e.g. through activity) could be detrimental. The significance of social activity (over disengagement) in later life remains hotly debated (e.g. Chen, 2001; Reitzes, 1995; Tornstam, 2005) but is still central to a great deal of government policy across the developed world focussing on the enhancement

² Not to be confused with activity theory from Vygotsky's work in the 1920s and used in HCI.

of older people's well-being (e.g. Reich, Zautra and Hill, 1987; DoH, 2006; WHO, 2002). Adhering to a particular generalisable view in this way allows gerontological theories to be operationalised across wider cultural contexts to effect change.

Many psychological accounts of ageing have similarly characterised it in an objective fashion, focusing on the substantive losses in memory, intelligence and other cognitive functions that occur with age (Marcoen, 2007). Memory has an important guiding role in all activity and thinking. Working memory, i.e. the ability to retain information over short periods of time for constant reference, is central to many cognitive tasks and reduces with age (Salthouse and Babcock, 1991). This is seen to be as a direct consequence of reduced information processing speed. The ability to access pre-established memories is also compromised. Typically 'declarative' or 'explicit' memory (i.e. the facts that one holds in one's mind) has been shown to decline with age. This means that remembering things without cues becomes particularly difficult as one gets older. This includes the remembering of names (semantic memory) as well as the details of where and when something happened (known as episodic memory). Tasks with an element of recognition involved are easier, such as recalling the meanings of words (Salthouse, 1991). Implicit or 'procedural' memories (i.e. those that are learnt through engaging in activities over an extended period of time) appear to bypass the conscious process of 'remembering' and are more robust, showing no decline with age (Fleischman, Wilson, Gabrieli, Bienias and Bennett, 2004). This kind of memory is defined by context and includes memory for reading, typing, tying your shoe laces, counting, driving, etc.

In order to explain the effects of ageing on intelligence, psychologists have distinguished between two underlying aspects, those of *fluid* and *crystallised* intelligence, which are affected differently by the ageing process (Cattell, 1987). Fluid intelligence relates to the non-specific skills and abilities most present in youth which are important in dealing with novelty. These are easily transferrable skills such as pattern recognition, abstract reasoning and problem solving. They tend to peak around young adulthood and then decline slowly. Crystallised intelligence on the other hand refers to the contextual knowledge which is established throughout a life time of education and experience (including things such as vocabulary and the application of domain specific knowledge) and which continues to increase with age, peaking at about 65 and then declining as well.

In common with activity theory and the medical perspective, psychological accounts such as these reinforce an idea of ageing as an accumulation of 'losses' or 'deficits'. The tendency with all these perspectives is to construct a generalised objective notion of

'ageing' and 'older people' which can direct appropriate remedial interventions across wide cultural contexts. It is this pragmatic view that most often defines technological support for ageing and, as will be seen in the later discussion of technology in relation to ageing, is commonly enlisted to support physical, cognitive and social deficits in older people.

Whilst the 'losses' or 'deficits' of old age are apparent to all they are not the only way to frame our understanding of ageing. Indeed this objective and deficit-driven perspective imposes a notion of ageing onto older people that may not be reflected in the way that they think about themselves obscuring their sense of agency in lieu of contextual constraints or opportunities. For instance there is an interesting 'well being paradox' associated with ageing whereby the objective 'deficits' of old age have been shown to have little effect on subjective well being and life satisfaction which often increases with age (Mroczek and Kolarz, 1998). Reconciling objective notions of being older with the subjective experience of real individuals has been the concern of gerontology in more recent times (Johnson, Bengston, Coleman, and Kirkwood, 2005) and is at the core of this thesis' consideration of technology use by older people.

There are a number of developmental lifespan theories which have been influential in challenging this deficit-driven notion highlighting the developmental potential that remains throughout the lifespan thanks to this inner experiential dimension. Erik Erikson, coming from a psychodynamic tradition, was one of the first developmental theorists to fully articulate the importance of the whole life span in terms of *psychosocial* development (Erikson, 1959; 1986). He characterised a full life span in terms of eight *life stages*, with each stage being coloured by the shifting relationships of the self to the social or *outerworld* (Erikson, 1963). Erikson believed that these shifts were experienced as internal conflicts or *identity crises* which when resolved lead to psychosocial development. Resolution at each life stage would only occur when the actuality of both extremes involved in the conflict was acknowledged. Unresolved conflicts continued to impede later development in subsequent stages. Erikson's 8 life stages are shown in the table below:

Table 1: Erikson's life stages

Stage	Approximate Age	Nature of conflict	Virtues gained through resolution of conflict
Infancy	Birth to 1 year	Trust versus Mistrust	Hope
Early Childhood	1 to 3 years	Autonomy versus Shame and Doubt	Will
Play Age	3 to 5 years	Initiative versus Guilt	Purpose
School Age	6 to puberty	Industry versus Inferiority	Competence
Adolescence	13 to 18	Identity versus Role Confusion	Fidelity
Young Adulthood	18 to 35	Intimacy and Solidarity versus Isolation	Love
Adulthood	35 to 65	Generativity versus Self-absorption and Stagnation	Care
Old Age	65 to death	Integrity versus Despair or Disgust	Wisdom

The eighth stage, that of *old age* was about integrating the legacy of a life already lived, accepting the decisions one had made in one's life in terms of a greater wisdom. Development within Erikson's theory rested upon the idea of the self adapting to the outer social world and the particular shifting dynamics of interdependence that related to each life stage. Erikson's theoretical perspective recognised physical, psychological and socio-cultural influences as distinct but inter-related and offered a means of reconciling subjective experience with an outside (though not necessarily objective) view.

Erikson's view of ageing has since been criticised by other psychological gerontologists (e.g. Baltes and Baltes, 1990) for being too normative: perpetuating an idealised view of what has been termed 'successful ageing', anticipating particular traits over others as indicators of healthy development in old age and ignoring the idiosyncrasies of subjective experiences of ageing. Indeed Erikson's developmental theory was posthumously extended by his own wife Joan to incorporate a ninth stage, that of *gerotranscendence*, which was intended to accommodate the lived experience of very old individuals (over 70) in the ageing populations of the developed world (Erikson and Erikson, 1998) being drawn from her own experiences of living into her nineties.

Baltes and Baltes (1990) also acknowledged the centrality of subjective experience when attempting to understand potential paths to 'successful ageing' (Baltes and Baltes, 1990) but balanced this with objective notions of cognitive functioning. Their theory reframed development in old age to show how individuals commonly balanced the 'losses' that they experienced through the development of other capacities or 'gains'. They believed that it

was this adaptive capacity that determined the route to ‘successful ageing’ rather than the resolution of pre-determined psychosocial crises. Through studies of older people’s expressions of crystallised and fluid intelligence (reframed in their terms as cognitive mechanics and cognitive pragmatics respectively) Baltes and Baltes showed how these resources could be coordinated to great effect, compensating for age-related declines in cognitive mechanics through their better coordination thanks to cognitive pragmatics. They believed that it was the adaptive and directive purpose of personal knowledge and subjective experience that was central to expressions of ‘wisdom’ in old age (Baltes, 1993), describing this response in terms of *selective optimisation with compensation* (Baltes and Baltes, 1990; Freund and Baltes, 1998). In this model *selectivity* relates to the choices older people make in terms of directing themselves towards particular life goals over others, i.e. a self-limiting directionality intended to enhance existing potential. *Optimisation* involves the acquisition, application and coordination of personal resources to attain selected goals and *compensation* is the employment of alternative or substitutive means to attain the same goal.

Baltes and Baltes (1990) illustrated this adaptive approach using a study by Salthouse (1984) which compared older and younger typists. Salthouse found that whilst the older typists were slower in terms of typing speed their overall performance tended to be superior to the younger typists. Upon further investigation it seemed that the older typists had learnt to compensate for their slower typing speed by training themselves to read and remember much longer passages than their younger counterparts. This had not happened overnight of course and could only be achieved through extensive practice, training and knowledge acquisition over an extensive period of time. In this way Baltes and Baltes (1990) showed how these older typists were able to compensate for losses in cognitive mechanics through their use of cognitive pragmatics.

In Baltes and Baltes’ theory, it was older people’s capacity to transform their inner experience that was pivotal to explaining their experience of later life. The theory also pointed to the role of emotional development as an important counterbalance at the limits of cognitive functioning, offering solid foundations for maintaining the integrity of the self concept in lieu of the deficits of old age (Baltes and Carstensen, 1999). Carstensen (1992) expanding on this idea, has developed her own socioemotional selectivity model. Carstensen shows how the perceived proximity of death for older people can affect their selectivity by increasing the import of emotionally meaningful and therefore socially-oriented goals rather than those based on the acquisition of information (Carstensen, Isaacowitz, and Charles, 1999). The consequence of this is, according to Carstensen, that

older people will tend to avoid superficial social contact and seek a deepening intimacy within their existing close relationships.

Other theorists have pursued the social and self-referential effects of such adaptive approaches to ageing but have pointed out the increasingly transcendent nature of the self with advanced age (Tornstam, 1989; 1996; 2005). *Gerotranscendence* is a developmental theory of positive ageing which is concerned with the subjective experience of older people and highlights the redefinition of self that continues to take place even when cognitive resources are exhausted. From studies eliciting the subjective experiences of older individuals, Tornstam explains gerotranscendence in more detail,

The individual becomes, for example, less self occupied and at the same time more selective in the choice of social and other activities. There is an increased feeling of affinity with past generations and a decreased interest in superfluous social interaction. The individual might also experience a decreased interest in material things and a greater need for solitary "meditation". Positive solitude becomes more important. There is also often a feeling of cosmic communion with the spirit of the universe, and a redefinition of time, space, life and death. (Tornstam, 2005; p. 3).

Tornstam outlines a reorientation of personal understanding that can appear as a direct result of the ageing experience. This understanding stands in opposition to objective, material notions of existence and ageing being rooted in a transcendent sense of self where meaning in life is less self-centred and more altruistic. Gerotranscendence takes older people's capacity to transform their inner experience as being pivotal in explaining their experience of later life but shifts the emphasis away from self-direction and towards self-transcendence.

Gerontological theories are manifold. So far deficit-driven, objective approaches to ageing have been discussed provided by medical, cognitive and social activity theories. 'Positive' developmental lifespan theories have also been considered, which address the subjective experience of ageing through psychosocial (Erikson and Erikson, 1998), cognitive (Baltes and Baltes, 1990) and socioemotional adaptation (Carstensen, 1992) and transcendent self-reorientation (Tornstam, 2005). These lifespan theories will be revisited later on. In the next section the changing experience of ageing in developed countries is considered and the role of everyday technology in support of ageing.

Ageing in the Context of Industrialised Societies

The process of industrialisation in the developed world has had a dramatic impact on the socio-demographics of industrialised nations and consequently the experience of ageing. Advances in medicine, nutrition and technology mean that people are now living far longer than they did a century ago. In the UK life expectancy for men has increased from 45.7 years in 1901 to 76.2 years in 2002 and for women from 49.6 years to 80.7 years over that same period (ONS, 2006). Similar trends are apparent in developed nations across the world (UN, 2007). Whilst this ageing demographic is of course a welcome result of development, industrialisation has also transformed the experience of growing older in these societies changing the social dynamics of everyday life and increasing the pervasiveness of technology in the domestic sphere. These changes have introduced new obstacles and opportunities for older people in dealing with the 'deficits' of ageing either exaggerating or compensating for them.

Older people are now more likely to live separated from family and friends and risk being more socially isolated than ever before (McCarthy and Thomas, 2004). There is also a trend towards solitary living amongst the older generation which continues to increase (UN, 2007). Alterations to family structures have undermined 'traditional' sources of social support and the notion of 'family' as a source of stability is no longer a given for those growing older in a modern industrialised society. Families rarely remain in a particular locality from generation to generation and mass migration has become common for economic reasons meaning generations tend not to live together or in the same neighbourhood (Abrams, 1978; Silverstein and Bengtson, 1993; UN, 2007). This is all with a backdrop of shifting emphasis towards individual choice rather than family responsibility in developed societies (Giddens, 1990) and a growing ethos of 'independent living'³ (e.g. EC 2007) amongst older people themselves where autonomy, self-reliance and self-determination are high on the agenda for them even into advanced age.

The subjective experience of these changes remains unclear. Living alone whilst more common may also be through choice and not necessarily detrimental to the person experiencing it. Social isolation can have a number of negative effects on both physical and psychological well-being when experienced as loneliness (Thompson and Heller, 1990). Older people living alone are more likely to report feeling lonely (Bowling, 2005) and this can increase their susceptibility to depression (Choi and McDougall, 2006) as well as being

³ Also referred to as 'aging in place' in other countries such as the USA.

linked to all causes of mortality and morbidity (Cassell, 1976; Cobb, 1979; Cohen and Syme, 1985; House, Landis and Umberson, 1988). Physical debility and reduced motivation as a result of depression can further compound the sense of social isolation and loneliness that older people experience (Findlay, 2003). However it should not be assumed that a lack of social contact is either unintended or detrimental with other studies showing that older people will actively choose solitude for their own benefit (e.g. Tornstam, 2005).

Ageing and Everyday Technology

Technology in its broadest sense can be useful in offsetting the negative effects (deficits) of ageing (Baltes and Baltes, 1990) and in this thesis it is the particular dynamic that emerges between person and technology that is of interest. For the most part technologies are not designed explicitly for older people but a number of common place technologies are now pivotal in maintaining their sense of independence and autonomy within their own homes allowing them to remain there longer without having to enter supported accommodation. Technologies such as cookers and refrigerators support independence by easing daily tasks whilst mobility is often enhanced through the use of cars, electric mobility vehicles and public transport (Mollenkopf, Marcellini, Ruoppila, and Tacken, 1999). When physical mobility is curtailed a sense of social involvement is often maintained through the use of the telephone (Wenger and Burholt, 2001), radio and television (Percival, 2002).

Computers and computer-based technologies also have great potential with regards to supporting older people's independence and well being but usually have not been designed to accommodate older users either. Indeed computers have rapidly become essential to modern living pervading most aspects of daily living for older people in the developed world. Adapting to new computer-based technologies has become a necessity for older people if they want to be included in the current information society (EC, 2007). This not only concerns the computer itself but also ubiquitous technologies which are operated through the use of embedded computers as seen in mobile phones, cash dispensers, ticket machines, set-top boxes for digital TV, games consoles, etc. Intimately connected to operating these technologies is an understanding of the underlying infrastructure that they operate through; that of digital networked devices, the Internet and the World Wide Web.

Internet-based forms of social contact can provide older people with greater opportunities for social interaction at a distance and can enable a sense of involvement in society in spite

of mobility constraints and dislocated families. The benefits of Internet access include cheaper travel, financial services, entertainment and goods (PAT, 2000), the enhancement of basic freedoms and cultural life (Tambini, 2000), access to the accumulation of human knowledge (Brink, 2001) and involvement in the decision-making processes associated with government (Godfrey and Johnson, 2008). The Internet has also transformed the sites and practices of social transactions often superseding earlier written and spoken forms that older people had grown up with and are familiar to them. Civil and social life is rapidly shifting online leaving many older people unprepared for such changes. Whilst there is great diversity in older people's computer and Internet literacy the majority are still in the position of having to learn them from scratch before they can make use of their potential. The absence of these prerequisite technical literacies can exclude them from the pragmatic and social benefits of computers and the Internet.

Effective use of computers and the Internet by older people has been shown to have a positive impact on their quality of life by providing access to online forms of social contact, assuaging feelings of loneliness and social isolation (Czaja et al., 1993; White, McConnell, Clipp, Bynum, Teague, Navas, Craven, and Halbrecht, 1999; Wright, 2000; Carpenter and Buday, 2007; Fokkema and Knipscheer, 2007). Online relationships can allow older people to widen their social circle, providing them with companionship in a manner which supports independence and equality in relationships (Wright, 2000) at a time when reduced mobility might curtail existing social activities.

Despite the opportunities provided by computers and the Internet the adoption rate amongst the older population remains relatively low. Figures about Internet use in the UK from 2005 show that 72% of those aged between 55 and 64 have been online in the last three months whilst only 30% of those over 65 years have done the same (ONS, 2009). Whilst the oldest age group shows the biggest increase of any age group up from 15% in 2005 (Livingstone, Van Couvering, and Thumim, 2005) this is still a minority figure.

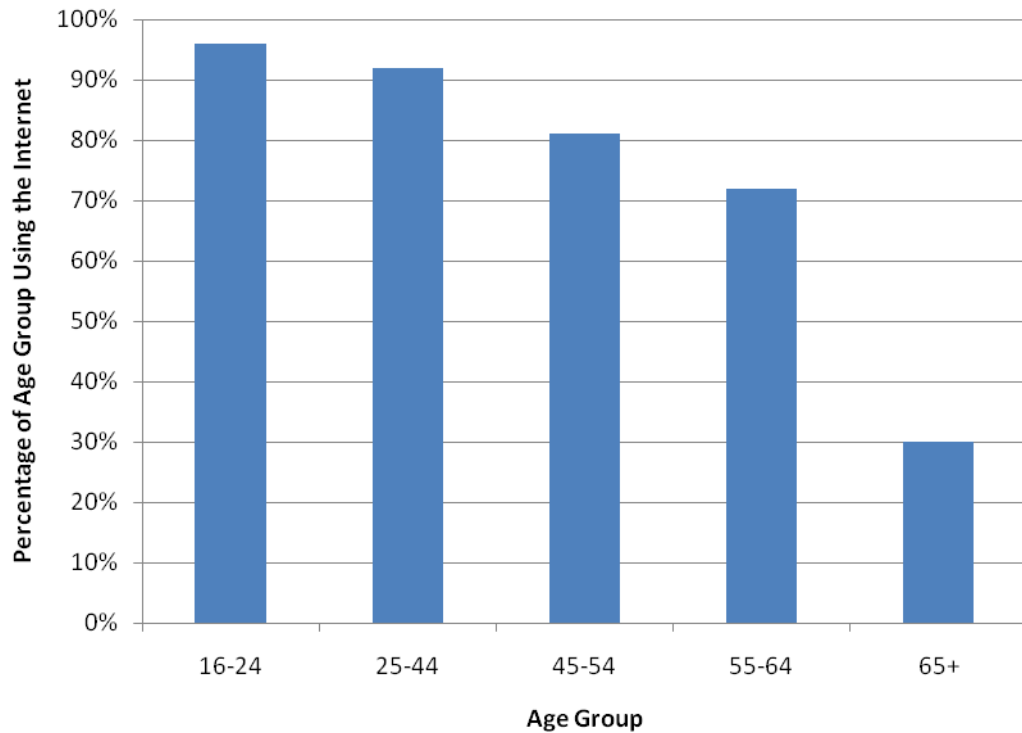


Figure 1: Adult Internet Use (ONS, 2009)

Similar increasing but minority figures are apparent in the US (Jones and Fox, 2009) and across Europe (EC, 2007). Understanding the issues that older people face when using such technologies is therefore imperative if equitable access to online services and social life is to be provided. Designing technology to suit older users is one way of approaching this dilemma. In the next section the role of ageing theory in making computer technology more *accessible* to older people is examined.

Computer and Internet Accessibility

Attempts at making computers and the Internet more *accessible* to older users have approached their use of them at a mostly functional level, redesigning or adapting user interfaces to reconcile their physical and cognitive abilities with the design of the interface. The emphasis in such *accessibility* measures is on ageing as an accumulation of physical and cognitive deficits. The decline in physical and cognitive abilities that older people experience as they age means that they are often unable to interact with computers and the Internet in the same way as their younger counterparts (Chadwick-Dias, Tedesco and Tullis, 2004). Reduced physical dexterity, sensory acuity and declining cognitive abilities all impact on their ability to learn and use the Internet and older adults are at a distinct disadvantage when confronted with web technology (Coyne and Nielsen, 2002).

For established designs, accessibility is usually enhanced by engaging a small sample of older people in one-off usability tests with the technology in question. This provides a snapshot of the person-technology dynamic in which problems encountered during use are taken as indicative of age-related obstacles when compared with younger users on the same tasks (e.g. Fidgeon, 2006). The use characteristics of the elderly sample are then accommodated as part of the design (or redesign) process or form the basis for design guidelines which are intended to generalise to all users of the same age group using similar technologies. Web design guidelines for older users derived in this way are numerous (e.g. Holt, 2000; Agelicht, 2001; NIH/NLM, 2002; Coyne and Nielsen, 2002; AARP, 2005; W3C, 2005; Kurniawan and Zaphiris, 2005; Fidgeon, 2006; Abou-Zahra, Brewer and Arch, 2008). They deal primarily with the elements of web design that affect older users' online reading behaviour. As such they encourage the simplification and amplification of textual labels and graphical symbols used for activating online functionality along with the use of plain language rather than jargon for explanations (e.g. Kurniawan and Zaphiris, 2005, Fidgeon, 2006). Older users' ability to find relevant information online by scanning through content on a web page does not appear to be impaired compared to that of younger users but it can be complicated by busy web pages (e.g. with excessive advertising) (Fidgeon, 2006). Also deep and narrow information hierarchies within websites can make the reading of content across multiple web pages difficult by increasing the cognitive load necessary for memory recall. Beyond guidelines to ease the standard reading experience of web interaction, there are also suggestions that feedback should be given in other sensory modes (e.g. visual and auditory) to compensate for individual sensory impairments relevant to reading behaviour (e.g. Zajicek and Morissey, 2003; ETSI, 2003; Fidgeon, 2006).

Currently accessibility is the primary means of explaining older people's engagement with computer and Internet-based technology and of designing it to suit their needs (Arch, 2008). Accessibility measures may address older users specifically (Kurniawan and Zaphiris, 2005; Yousef, 2001) developing elder-specific interfaces for mainstream applications such as email (e.g. Hawthorn, 2002; Dickinson, Newell, Smith, and Hill, 2005) which incorporate larger button and font sizes, high contrast between background and foreground colours and simplified menu and navigation options which limit functionality to the bare essentials. These features are tailored to accommodate age-specific declines in the visual and cognitive capacities of older users. Alternatively accessible designers may pursue an approach to design which attempts to create solutions that will benefit and include all possible users. This latter approach has been called 'universal design' (Stephanidis, 2001a; Plos and Buisine, 2006), 'inclusive design' (Keates and Clarkson,

2004), 'Design for All' (Klironomos, Antona, Basdekis and Stephanidis, 2006), 'user sensitive inclusive design' (Newell and Gregor, 2000), 'universal usability' (Schneiderman, 2000) or 'universal accessibility' (e.g. Stephanidis, 2001a; Savidis and Stephanidis, 2006). Here simplicity is either taken as a positive aspect of design for all users (as in 'Design for All', inclusive or universal design) or a degree of flexibility is introduced with regards to the complexity of the interface which allows it to be attenuated in line with the abilities of the user (as described by user sensitive inclusive design, universal usability or universal accessibility). For instance Schneiderman (2003) suggests that a multi-layered approach to interface designs can allow access to the same online resources by both novices and experts, citing the American National Cancer Institute website (<http://www.cancer.gov/>) as an example of good practice. In this example the degree of system complexity available through the interface is left entirely up to the user. In other approaches the system itself plays a larger part in establishing relevant interface decisions automatically (e.g. Stephanidis, Paramythis, Akoumianakis and Sfyrakis, 1998; Stephanidis, 2001b) by referring to internal models of potential users and/or contexts. In both cases abstract notions of 'the current user' are instantiated as discrete interface characteristics which are intended to support different metaphors for accessing underlying functionality. As Stephanidis (2001b) points out the adaptability of such automatic systems is embedded in design and runtime decisions and should not be confused with the user led adaptations described by *tailorability* which, as is evident in the next chapter, have a bearing on understandings of interaction based on appropriation.

Whilst significant in their own right all the approaches to accessibility described here rely on models of interaction in relation to older people which have grown out of physical (medical) and cognitive understandings of ageing. They carry with them an objective stance towards use which emphasises the functional aspects of access (i.e., the ability to access the instrumental functions present at the interface) and functionally static notions of ageing. Whilst valid and necessary in relation to certain forms of disability experienced by older people, they do not provide any deeper sense of what it is that individual older users want to do with the technology and how this might impact on their potential for action within a given context. By adherence to accessibility guidelines, web designers are able to provide access to interface functionality in relation to functional disability. However, this prioritisation does not necessarily reflect the concerns of real users in making sense of the technology and turning their use into a relevant and meaningful activity within their lives. Whilst functional difficulties do present themselves as obstacles to older people in most cases they still learn to overcome these (Charness and Czaja, 2005). Other aspects of early use have been shown to have an overriding effect on

successful use including a lack of knowledge in relation to terms and conventions implicit in web navigation and difficulties in developing the exploratory approach needed to explore and make sense of web-based functionality (Chadwick-Dias et al., 2004, Sayago and Blat, 2009). It would not be possible to address such things simply through an accessible interface. Clearly other aspects of the person-technology dynamic have a bearing on access and must be addressed in other ways.

The heterogeneity of older people is difficult to capture through the objective generalisations of accessibility measures. The physical and psychological impairments that older people suffer occur gradually and can fluctuate in severity disabling them to varying degrees depending on the time of day or season of the year (Hultsch, MacDonald and Dixon, 2002). In addition older people are an extremely heterogeneous group of themselves and are not 'disabled' in the same way as one another or in relation to other user groups, showing great diversity in physical and psychological functioning (Gregor, 2002; O'Hanlan, 2004). The mapping to accessibility is therefore not a clear and permanent one with different older users needing quite different degrees and forms of support. The need to adapt to diverse user characteristics both within the older user group and during individual use has already been addressed to some degree through the adaptable user interfaces described by universal usability and universal accessibility (Schneiderman, 2003; Savidis and Stephanidis, 2006). However even within these approaches there is still a focus on functional design as the ultimate solution.

Accessible designs which aim for simplicity at the interface can be problematic for other reasons. Use of such technologies can carry a stigma for older people associated with disability which deters them from using them (Keates and Clarkson, 2003). Also the 'dumbing down' of interfaces can negate the learning of digital literacies which have become necessary for inclusion in developed society (Hawthorn, 2003). Underlying motivational issues can negate the usefulness of accessibility measures entirely with older people often not choosing to adopt computers and the Internet at all because they perceive little relevance to them (Selwyn et al., 2003; Dickinson and Hill, 2007; Richardson et al., 2005) or benefits to their using them (Sharit et al., 2004; Melenhorst et al., 2001; Melenhorst et al., 2006). Such decisions can be down to a lack of experience with similar technologies in the past (Ahn et al., 2008; Do Campo Rama, 2001), generally negative attitudes towards computers (Kelley, Morrell, Park and Mayhorn, 1999) or other contextual factors which whilst significant to that person remain invisible to current notions of accessibility (Kelly et al., 2007).

Making Computers and the Internet Relevant and Meaningful to Older People

The issue of 'relevance' in relation to the person-technology dynamic is not a simple one to address: how do you make computers and the Internet relevant to older people, indeed can you do this through design? Is it not an aspect of one's active involvement in the person-technology dynamic that makes a technology relevant to oneself?

Some sense can be made of this by looking at those older people who are already online and the overt choices that they make in relation to using particular computer applications and websites. Many studies have highlighted older people's preference for email with it being their most popular online activity (Goodman, Syme and Eisma, 2003; Dickinson et al., 2005; Fox, 2004; ONS, 2009; Jones and Fox, 2009) particularly as a means of keeping in contact with family and friends (Sayago and Blat, 2010). The second most popular activity is searching for information (ONS, 2009; Jones and Fox, 2009). Informational content of interest to older people includes health information (ONS, 2009; Morrell, Mayhorn and Bennett, 2002), information on travel, goods and services (ONS, 2009), online newspapers (ONS, 2009; Morrell et al., 2002) and genealogy (Fox, 2004; Goodman et al., 2003). Other studies have also highlighted the predominant use of word processing amongst older computer users (Selwyn, 2003). When considering aspects of the Internet that older people do not engage with, it is evident that they are less likely than younger age groups to search for information about a hobby, surf for fun, download or play games, images, films or music (Fox, 2004). They are less likely to use online banking services, to make online telephone or video calls, to download software or to upload self-created content (ONS, 2009). They are highly unlikely to post to chat sites, blogs or newsgroups or to sell goods or services online (ONS, 2009).

These preferences show relevance in terms of discrete activities that are acceptable to older people where the benefits of use have already been realised. Whilst these preferences are important to account for they do not give us a view into the process by which such activities become relevant in the context of people's everyday lives. The point here is that 'relevance' has a fluid phenomenological quality, being determined by subjective interpretations of the technology and the shifting demands of an ageing context. In order to see the issue of relevance clearly a lens is needed which can focus in on such phenomena.

This thesis moves beyond functional accessibility as a way of understanding older people's engagement with computers and the Internet and explores the ongoing evolution of this

emerging person-technology dynamic ultimately proposing an alternative lens (that of *appropriation*) which will allow us to consider this engagement in relation to positive adaptations to ageing.

So, to summarise, in this chapter the current approach to accessible design for older people has been outlined as driven by a 'deficits' model of ageing informed by objective notions of physical (medical), cognitive and social ageing. An alternative approach has been suggested which would be informed by 'positive' and adaptive models of ageing derived from lifespan theories of psychosocial development. These would promote a more balanced view of accessibility, acknowledging the heterogeneity of older people and their sense of agency and innovation in relation to the person-technology dynamic. Finally an alternative lens has been suggested which can address issues of relevance and meaning in relation to older people's engagement with computers and the Internet and as an aspect of their broader adaptations to ageing.

Chapter 3 –Appropriation

Covered in this chapter:

In this chapter *appropriation* is presented as a way of understanding the person-technology dynamic and as a suitable vehicle for exploring the adaptations to ageing that are played out through older people's ongoing use of computers and the Internet. A working definition of appropriation is developed with reference to existing literature to be used throughout the thesis as a way of orienting further investigation and analysis.

Introduction

Current notions of accessibility are able to capture the functional aspects of older people's use of computers and the Internet. This remains an important aspect of use but embodies an objective stance towards ageing which emphasises its deficits and ignores individual responses to the person-technology dynamic in respect of ageing. In this thesis the emphasis is shifted towards the subjective experience of ageing and how this influences older people's understandings of computers and the Internet and their corresponding uses for them in light of their own experience of age-related change. This frames older people's understandings of the meaning and potential for computers and the Internet within their broader experience of ageing. In order to do this an alternative lens of appropriation is used which acknowledges the ongoing negotiation that takes place with regards to defining a technology's purpose and relevance within the context of older people's lives.

Appropriation represents a different stance towards the person-technology dynamic to that presented within accessible design. It suggests that when people engage with technology their interpretations of what that engagement is about have a significant bearing on its ultimate use. Despite the efforts of technology developers and designers to pinpoint the most useful, efficient, and accessible functionality and designs, users persist in defining their own purposes for that same technology. Far from being a rare occurrence this is a widespread phenomenon. There are many everyday technologies that can be used to illustrate this. For instance, the Internet was originally designed by the United States military (in the form of DARPA NET) to share computing resources over long distances (Leiner, Cerf, Clark, Kahn, Kleinrock, Lynch, Postel, Roberts and Wolff, 2009). It was never anticipated that the same network would be used in the way it has, supporting commerce,

business and government administration and evolving new forms of entertainment, social interaction and global community involvement. Similarly mobile phone text messaging was designed as a limited medium to support technicians working on mobile networks (Thurlow, 2003). It was never envisaged that this technology would be appropriated by teenagers as a way of chatting with their friends irrespective of time or place, without having to go through the parental veto (Ling, 2001) ultimately resulting in the evolution of emoticons and text speak as new communicative practices. These are all examples of appropriation. As Salovaara points out,

Design does not determine how and for what purposes a system will be used in real settings, but rather is a component in a more complex, evolving process in which unforeseen contextual features, social factors, creativity, and opportunism, as well as new user interpretations, also play a part. (Salovaara, 2008, p. 209)

Specifically this thesis looks at the appropriation of computers and the Internet by older people, that is, their active engagement in the process whereby they make these technologies their own and transform them through the process. In contrast with objective notions of the person-technology dynamic (as seen in models of accessible design) a study of appropriation explores the nuances of the relationship, contextualising computer use within the lived experience of older people, adapting over time in accordance with the prevailing experience of ageing. As such it examines the ongoing interplay between older people's interpretations of the role of computers and the Internet placed within the context of their whole lives. It looks at the impact of actual use on those original interpretations and how these play out through new understandings or redefinitions of use for the technology. Unlike the lens of accessibility, appropriation stretches before and beyond the first encounter with the technology, starting from prior understandings through to a point where it has been adopted, proven its worth and has been integrated into the daily life of that person. It is this whole process of personal, social and technological adaptation that takes place in order for an older person to transform their use of computers and the Internet into a meaningful everyday activity.

Computers and the Internet appear in older people's lives in the midst of an ageing context which colours their interpretations of use. Orientations to life shift as a result of age-related change influencing decisions to engage with computers in the first place as well as the opportunities explored through ongoing use. Equally individual responses to age-related limitation are not uniform and can impact on potential uses in idiosyncratic ways.

Alternative framings of the person-technology dynamic are therefore necessary in order to accommodate the more negotiated aspects of technology use that are pertinent to an ageing context. Appropriation is one way of examining the emergent relationships between older people, computers and the Internet.

Whilst appropriation is now a well established phenomenon within computer-supported cooperative work (CSCW) and human computer interaction HCI (e.g. Dourish, 2003; Balka and Wagner, 2006) and adaptive ageing is becoming an important way of understanding older people's engagement with computer-based technologies (e.g. Bouwhuis, 2001; Pew and Hemel, 2004) so far there have been few studies that have combined these approaches by focusing explicitly on older people's appropriation of computers and the Internet as part of a positive and adaptive approach to ageing. Broader studies of appropriation have attempted to frame aspects of the person-technology dynamic which are pertinent to explaining this phenomenon. Numerous related terms have been developed which shed light on appropriation. Some focus on the ultimate adoption decisions of users through *technology adoption* (Rogers, 1995) and *technology acceptance* (Bagozzi et al., 1992) whilst others emphasise the user-centred design aspects of appropriation which appear through *tailoring* (Trigg and Bodker, 1994), *customization* (Dourish, 2003), *reinvention* (Von Hippel, 2005), *user innovation* (Von Hippel, 2005) and *everyday adaptive design* (Moran, 2002). Still others seek to identify originating processes for appropriation in terms of *domestication* (Silverstone), *familiarity* (Turner, 2008) and *sensemaking* (Weick, 1995). Using these definitions as a starting point an interpretive framework is developed which will help us to isolate different phases of the appropriation process pertinent to understanding older people's appropriation of computers and the Internet.

Appropriation as Technology Adoption

Adoption marks the beginning of the appropriation process. It is the initial decision to engage with the technology by purchasing and/or using it. The technology adoption cycle (Rogers, 1995) describes the underlying decision making process as moving from:

1. First knowledge of an innovation⁴ (the knowledge stage) to;
2. Forming an attitude toward the innovation (the persuasion stage) to;
3. A decision to adopt or reject it (the decision stage) to;

⁴ In the context of this thesis 'innovation' can be read as computers and the Internet.

4. Implementation of the new idea (the implementation stage) and finally to;
5. Confirmation of this decision (the confirmation stage).

Knowledge of particular innovations (in this case computers and the Internet) is communicated between groups within society from those that have already adopted the innovation to those that have not. This model categorises groups of users according to how likely they would be to adopt a particular technology in relation to other sections of society and by explaining the mechanisms whereby they diffuse this knowledge to other groups. The diffusion of innovations' model (Rogers, 1995) describes the first group of people to use a new product as "innovators", the next as "early adopters" followed by the "early majority", the "late majority" and lastly the "laggards". A comprehensive adoption process (i.e. where everybody in a given population has adopted the technology) is therefore said to follow a bell-shaped curve moving through the different adoption groups over time as shown in figure 2 below:

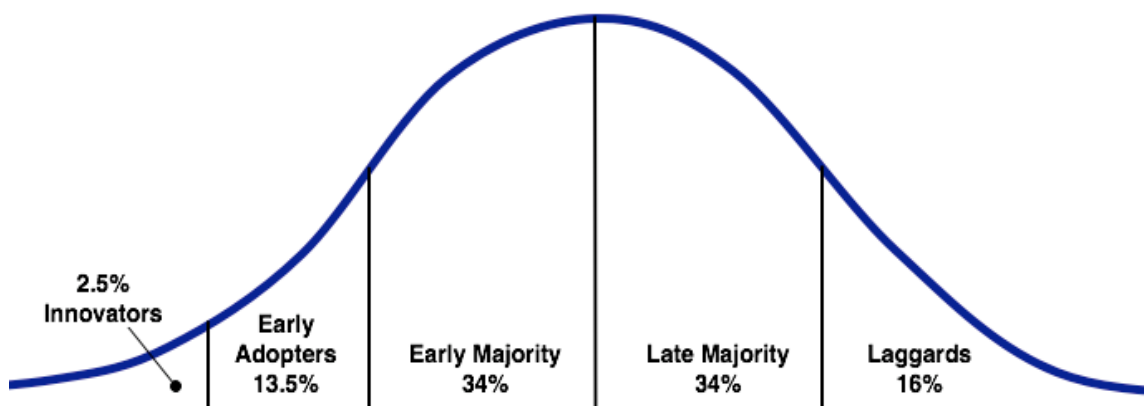


Figure 2: The technology adoption life cycle (Rogers, 1995)

One of the main criteria distinguishing these groups is that of age with the innovators and early adopters tending to be the youngest and the oldest adoptees being the late majority and the laggards. The ongoing diffusion of particular innovations (in this case computers and the Internet) is understood as being a result of peer influence and the belief by new adoptees that the technological practice is already widespread (Rogers, 1995). Implicit in this model is an assumption that innovations are communicated from one (younger) generation to the next (the older generation) which furthers adoption. Studies of technology adoption by older people (Mathur, 1999) have reinforced this aspect of the model, suggesting that younger socialisation agents (such as grandchildren in the home) are important in raising awareness of new technologies by older people before they choose to adopt them.

Research looking specifically at older people's adoption of computers and the Internet suggests that they are indeed late adopters of it. Figures about Internet use in the UK show that only 52% of those aged between 55 and 64 go online whilst a mere 15% of those over 65 years do so (Livingstone et al., 2005). This compares with 88% of those aged 16 to 24 (ONS, 2007). Similar minority figures are apparent in the US (Fox, 2004) and across Europe (EC, 2007). Broadly speaking, the model states that technology will be adopted when potential users perceive a *relative advantage* to using it (i.e. benefits), identify *compatibility* with their own needs (i.e. relevance) and assume manageable levels of *complexity* in learning how to use it (i.e. accessibility) (Rogers, 1995; Ryu, 2008). Other specific factors which affect adoption decisions for older people include socio-economic barriers such as cost, income and educational level (Eastman and Iyer, 2004; Juznic, Blazic, Mercun and Plestenjak, 2006; Mattila, Karjaluoto and Pento, 2003); lack of specific knowledge about computers (Compeau and Higgins, 1995; Venkatesh and Davis, 1996; Rogers, Meyer, Walker and Fisk, 1998) and the impact of prior experience with similar technologies (Agarwal and Prasad, 1999; Docampo Rama, 2001; Lu, Yu, and Liu 2003).

The character and attitudes of potential users towards the technology also have a bearing on adoption (Ofcom, 2006; Umemuro, 2004; Al-Gahtani and King, 1999; Kelley et al., 1999). Particular attitudes have been identified as enduring indicators of an adoption decision. Within the Technology Acceptance Model (Bagozzi et al., 1992; Davis, 1989), *perceived usefulness* (a prospective measure of benefits) and *perceived ease-of-use* (a prospective measure of accessibility) have been shown to be strong predictors of older people's rational intention to use computer-based technologies (Ryu, 2008). Perceived usefulness is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989, p.320). and perceived ease-of-use is defined as "the degree to which a person believes that using a particular system would be free from effort" (ibid, p.320). As already noted in the previous chapter other specific attitudes that are important for older users in relation to adopting computer technologies are the perception of benefits to use (Sharit et al., 2004; Melenhorst et al., 2001; Melenhorst et al., 2006) and the perception of their relevance to them (Selwyn, 2003). Older people may also have strong emotional reactions to using computers which colour the decision making process when they are inexperienced, with high levels of fear and 'computer anxiety' hampering initial use and adoption (Ellis and Allaire, 1999; Czaja et al., 2006).

Adoption studies appear to tell us a great deal about older people's early interpretations of computer technology and how these play out in terms of initial purchase decisions. In addition they do engage with issues of relevance and benefit in a certain sense. However, they are based upon rational decision making models which can only partially account for the adoption behaviour that is seen. Older people have limited knowledge of computers and the Internet before they start to use them and must therefore trust others in relation to adoption decisions. The high levels of anxiety present at adoption (Ellis and Allaire, 1999; Czaja et al., 2006) and the accompanying lack of awareness with respect to meaningful uses for these technologies (Hynes and Rommes, 2006; Hill, Beynon-Davies and Williams, 2008) means that the process is unlikely to be an entirely rational one for older people and is more likely to be influenced by socio-emotional justifications. Other research within social psychology has shown the overriding effect of such affective components in determining attitudes and behaviours such as these (e.g. Breckler and Wiggins, 1989). In addition adoption models do not consider the interactive process that takes place before, during and after adoption where the hypothetical potential of new technologies is tried out for real – the adaptations that older people make to accommodate them, the uses that they decide to put them to, the choices that they make to customise them for personal expression and the learning that takes place through them which brings reinterpretations of their purpose, benefits and relevance. Interestingly Rogers (1995) hints at something further being involved by acknowledging a process he calls *reinvention* (appropriation by another name) but leaves this largely unexplored in his research. Others have elaborated further on this phenomenon exploring the opportunities that users' reinventions might offer in terms of future product development (Von Hippel, 2005).

Appropriation as Design-In-Use

Appropriation has also been used as a way of understanding design dynamics that emerge from users, capturing the ways in which they will transform established designs once adopted and being used. A number of design theorists have explored appropriation in this user-centred design sense. Von Hippel (2005) whose early research focused on *reinvention* (Rogers, 1995) went on to explore *user innovation* as an ongoing expression of appropriation. He suggests that the earliest adopters of technology (what Rogers calls 'innovators' and Von Hippel describes as 'lead users') are likely to engage in their own innovation of products because they want "*exactly right products*" specific to their needs or simply because they enjoy the process of reinvention. This implies that the relevance and benefits of newly purchased technologies do not actually reside within the existing design waiting to be discovered but can emerge within the person-technology dynamic when

users recognise new potential for latent functionality or ways of adding their own aesthetic sense to existing designs. Through empirical evidence Von Hippel has shown how this kind of innovation can account for 10-40% of product innovation beyond that driven by the manufacturer (Von Hippel, 2005).

Similarly Moran (2002) uses the term *everyday adaptive design* to describe the ways in which all users adapt finished designs that enter their lives in order to incorporate their use into daily living. As he explains, “*Adaptation takes time and evolves continuously. Adaptation is how usefulness is, at last, realized and how satisfaction is derived from fitting systems to the patterns of everyday life*” (Moran, 2002, p. 16). Once again this points to the fact that users are actively involved in constructing the relevance, benefits and meaning of the technologies that they adopt.

Within the field of CSCW there has also been a growing interest in *appropriation* as a way of understanding how new technologies are adopted, adapted and used within organisations with a view to designing them so that they can accommodate these processes better (e.g., Balka and Wagner, 2006; Bansler and Havn, 2006; Dourish, 2003; Pargman and Wærn 2003; Rodden and Crabtree, 2004; Salovaara, 2007). The appropriation process has been broadly described in this context as,

the way in which technologies are adopted, adapted and incorporated into working practice. This might involve customisation in the traditional sense (that is, the explicit reconfiguration of the technology in order to suit local needs) but it might also simply involve making use of the technology for purposes beyond those for which it was originally designed, or to serve new ends. (Dourish, 2003, p. 467)

Work-based appropriation studies have shown how it is that new technologies become integrated into successful working practices through their transformation of the technology beyond initial design and expected use constraints, i.e. repurposing them through use (Pipek, 2005). This has been shown to take place through *tailoring* – the customisation or reconfiguration of technology to account for unanticipated uses (Trigg and Bødker, 1994) as well as through techniques for social agreement as to the significance of those uses e.g. the definition, sharing and distribution of agreed ‘standards’ (Trigg and Bødker, 1994; Pipek, 2005). Dourish (2003) on the basis of his own work-based appropriation study suggests that far from being activities forced upon users by the inadequacies of the technology, these processes are actually what makes technological systems meaningful within their particular communities of practice (Lave and Wenger,

1991) and are intrinsic to the collaborative process. So far CSCW has not considered appropriation as an aspect of older people's use of computer-based technologies. The emphasis of this thesis is not on the productivity of technical artefacts within discrete communities of practice, nor is it about how to enhance appropriation processes through design. However, Dourish's notion of appropriation as the principle 'meaning-making' process remains central.

Appropriation as a Psychosocial Nexus

Appropriation has also been used in a much broader sense to explain how societies and individuals integrate novel and previously unfamiliar phenomena into individual and collective practices through active processes of interpretation and negotiation. Here it is the interplay between social and psychological dynamics that is paramount in understanding appropriation and there are two distinct ways of approaching this: the social *constructionist* perspective which has grown out of sociology and the social *constructivist* approach which is more closely aligned to psychology.

Social Constructionist Approaches

Social constructionist approaches rest upon a dialectical understanding of the relationship between the individual and society to explain appropriation but emphasise the emergence of social phenomena as the product. Here appropriation is explored as a structure-agency dynamic and as an aspect of domestication.

Appropriation as a Structure-Agency Dynamic

Giddens' structuration theory attempts to reconcile an individual's sense of agency within a social context in two principle ways: firstly through the enactment of social norms which are seen as reconstituting social structures in a given social context (i.e. structuration) and secondly through *reflexivity* which is an individual's conscious capacity for creating alternative scenarios within that same context. Studies of appropriation using this theory (Barley, 1986; Orlikowski, 1992, 2000; DeSanctis and Poole, 1994) have looked at the integration of computer systems in work-based settings, showing how structuration occurs through the adoption of system elements that are seen to be in alignment with pre-existing social structures. Reflexivity seems less evident in these examples. Whilst no studies of this sort have been undertaken with older people, issues of agency are important ones to consider for this age group in particular whether appropriation of computers and the Internet takes place through the reinstatement of social norms in relation to ageing or through more reflective practices associated with personally innovative use .

Appropriation as an Aspect of Domestication

Another significant perspective in the development of the concept of technology appropriation has been that of domestication (Silverstone and Haddon, 1996; Berker, Hartmann, Punie and Ward, 2006). This is defined as the social process whereby technologies originally developed for public and economically productive use are transformed within domestic or personally defined domains. Domestication has been applied to technologies such as the television (Silverstone, 1994), the mobile phone (Sorenson, 2006) and the Internet (Hynes and Rommes, 2006) showing the negotiations that take place with regards to their introduction into the home or personal space, reinforcing the 'moral economy' of a household or social group rather than merely taking advantage of technologically defined opportunities. Within a domestication framework, appropriation is seen as the initial stage of a larger process which goes from *appropriation* to *objectification* to *incorporation* to *conversion*. The logic of domestication comes from the social construction of technology (SCOT) which questions the rationalism of the adoption model (Rogers, 1995) and all forms of technical determinism which view the transformative potential as residing within the technology itself. Domestication studies focus on the ways that symbolic meanings are actively constructed for technologies as part of social contexts, shaping the use of the technology. Shared meanings for domesticated technologies are seen as arising out of mundane conversation and the enactment of those meanings through everyday use.

Whilst there are few studies focusing on older people's domestication of computers and the Internet one such study which compared groups learning about computers and the Internet in Ireland and Holland suggested that this could only begin (i.e. appropriation could only begin) when older people were able to define a representation of the technology that fitted "the users' own self image" (Hynes and Rommes, 2006; p.128) This provides a slightly different perspective on the recognition of relevance and benefits than that seen in adoption studies. Domestication suggests that perceptions of relevance and benefit are not just static judgements made in relation to the pre-established purpose of computers and the Internet but are relational concepts intimately tied in with a sense of self and personal meaning.

Relating the results of this domestication study (i.e. Hynes and Rommes, 2006) to the experience of ageing suggests that computer and Internet appropriation was framed by these older people's desire for inclusion in modern society and that this was seen as being achieved by keeping up with the technological advances that they saw as central to such a society. The desire for inclusion was directly experienced as a wish to be involved in the

worlds of friends and family around them and particularly younger generations (children and grandchildren). Older people's individual learning about computers and the Internet in this study was also seen as a way of motivating younger family members to do the same so that they could gain employment and achieve success in education (Hynes and Rommes, 2006). This example shows how the personal meaning derived from computers and the Internet is also intimately linked to the social relationships that make up one's life and the way that age plays a part in defining these relationships.

Social Constructivist Approaches

Social constructivist approaches to appropriation originate in the ideas of Vygotsky (1978) and Leont'ev (1981), and have been further developed within activity theory, (e.g. Nardi, 1996; Bødker, 1991; Engeström, 1999). They also rest upon a dialectical understanding of the relationship between the individual and society to explain appropriation but emphasise individual meaning-making within a social context. According to social constructivism technical artefacts such as computers are not only tools with social and cultural currency, they are embodiments of established social and cultural knowledge. Using such tools as intended by the designers implies an internalisation of this knowledge as part of psychological development. However appropriation presents the process of internalisation not as a one way process but as an ongoing dialogue between individuals and society where resistance and negotiation are an intrinsic part of this phenomenon and form the bedrock of culture. Engeström (1999) suggests that the flipside of internalisation is *externalisation*; a process whereby users' innovations are communicated again as new social practices. Older people's appropriation of computers and the Internet is therefore not only about achieving technical proficiency for themselves but about addressing their cultural inclusion through having an active dialogue with the technology.

Appropriation as Sensemaking

The sensemaking perspective (Weick, 1995) also aligns itself with social constructivism and places individuals at the centre of the psychosocial nexus with regards to appropriation showing how they are active in interpreting novel or unexpected phenomena (in this case computers and the Internet) by organising them into coherent mental frameworks that 'make sense' to themselves and others. Weick suggests that sensemaking has seven basic properties:

1. It is grounded in identity construction. Individuals find out who they are by interacting with phenomena.

2. It happens retrospectively so that understandings appear in consciousness only after engagement with phenomena rather than before. Weick makes explicit connections with cognitive dissonance theory (Festinger, 1957) which states that people are motivated to make sense of phenomena because they wish to reduce their inherently contradictory attitudes, beliefs and actions in relation to those same phenomena.
3. It is inherently social and cannot take place in isolation. Meanings are established and preserved through dialogue and interactions with others.
4. It is driven by explanations that are plausible rather than accurate with an underlying assumption that the problems of complex phenomena are to do with equivocality rather than complexity per se.
5. It is focused on and by extracted cues which means that individuals explore phenomena on the basis of familiarity, identifying relevant features in relation to past encounters.
6. It is an ongoing project where individuals simultaneously explore and define the phenomena building on the sense of previous interactions.
7. It is enactive of sensible environments. Individuals share their understandings of phenomena through their actions and dialogues with others.

Sensemaking also challenges some of the central tenets of rationalism evident in adoption/ acceptance models (as well as accessibility models of design). For Weick engagement with technology is not defined by rational intention but by the primacy of action as interpretation. Rational understandings are viewed as the culmination of actions rather than the precursor to them. Given the concerns already voiced in this chapter over the inappropriateness of rational explanations for older people's adoption behaviour this makes sensemaking an important perspective to accommodate in relation to this thesis. Sensemaking is a framework that has already been used to understand adoption processes in relation to computer-based technologies (e.g. Seligman, 2006) but again such processes have not been related directly to older people's use of computers and the Internet.

As in approaches such as sensemaking this thesis maintains an emphasis on the self as being central to an understanding of appropriation and resolving questions of relevance, benefits and personal meaning. However the way in which the sense of self is constructed in relation to technology use will dictate what is found. As with accessibility there is a tendency by some to focus on the functional aspects of the self as being most relevant, i.e. the logical sense that one makes of a technology's function in a given situation and this rational stance is certainly true of some accounts of appropriation (e.g. Salovaara, 2008).

However this is only a partial view of the self and it would be difficult to see how such approaches could really do justice to the shifting perspectives of self that are present in relation to ageing. If as developmental lifespan theorists suggest (e.g. Erikson, Baltes, Carstensen, Tornstam) the central defining aspects of self change with age, defined not by physical abilities which are in decline but by other faculties developed in compensation, what notion of self is it that older people are appropriating to? Other research relevant to appropriation moves beyond 'logical purpose' as its defining characteristic and gives some pointers. Longitudinal studies of technology ownership have shown that time spent with a particular technology can change the nature of that relationship with a shift from issues of utility (i.e. purpose) at adoption to more aesthetic concerns after prolonged use. Things such as an appreciation of 'beauty' and 'goodness' come to the fore, such that personal identification with the technology as a representation of one's own values allows it to operate as a vehicle for communicating aspects of oneself to others (Karapanos, Hassenzahl and Martens, 2008). The link between the aesthetics of experience and the appropriation of technologies is echoed by McCarthy and Wright's six sense-making processes in which appropriation is viewed as arising out of a lived experience which is awake to feelings and emotions just as much as it is to the cold logic of purpose. Appropriating in their terms is about "making an experience our own by relating it to our sense of self, our personal history, and our anticipated future" (McCarthy and Wright, 2004; p.126). Here the self is recognised as a living centre of experience not only qualified by rational self direction also present to the preconscious non-verbal level of 'feelings'.

Appropriation as Familiarisation

Another interesting and related line of research looks at the emergence of *familiarity* in older people's relationships with technology, focusing on the importance of 'being with' technology rather than just 'doing with' (Turner, 2008), i.e. presence rather than purpose. Familiarity recognises the different levels of conscious engagement that accompany the appropriation process. Building on Heidegger's notions of 'present-at-hand' and 'ready-at-hand' (Heidegger, 1977), familiarity acknowledges the shift from foreground to background engagement that occurs from initial encounters to adept use and views the technology as becoming an intrinsic part of one's self rather than just being used as an external tool. There are important parallels with appropriation here.

Studies of older people's familiarisation with computers have identified some important pointers which relate directly to an exploration of appropriation (Turner, 2008): firstly that a growing understanding of computer terminology can help older people to take part in everyday activities and to not feel excluded; secondly that dispersed families and the

cost of communication encourage older people to make use of email as a means of contact and thirdly that an awareness of the physical processes of ageing on the part of older people themselves can make computers more relevant to them through their potential for supporting ongoing independence.

Defining Appropriation for this Thesis

The most significant approaches to appropriation have now been covered, from the rational decision making models of technology adoption and acceptance through to the design-oriented theories in CSCW and finally to the social constructionist and social constructivist theories which emphasise the social and psychological aspects of technological engagement respectively. In addressing older people's appropriation of computers and the Internet this thesis retains elements that are common to both social constructionist and constructivist approaches, namely the fact that appropriation is defined by a social context, emergent through use and develops over time. In addition this thesis takes a specific phenomenological route to exploring appropriation which is more in line with social constructivism than constructionism. Here appropriation is emphasised in terms of the self, highlighting the different layers of self expressed through appropriation, from the rational definitions of 'purpose' that identify the relevance and benefit of computers and Internet, to the less 'self-conscious' extensions of self that accompany 'being with' these technologies and finally considering social presentations of self that are expressed through acts of agency or acquiescence to social norms through use of the technology.

The specific emphasis in this thesis is also on relating developmental and adaptive aspects of the ageing self to emerging use of computers and the Internet by older people. In order to do this an important connection is made between appropriation and developmental theories that explain ageing in terms of psychosocial adaptation, i.e. those of Erikson, Baltes, Tornstam and Carstensen. In this thesis the connection between appropriation of computers and the Internet and adaptation to ageing is made explicit and explored in depth to answer the following questions:

1. *How do older people establish issues of relevance, benefits and personal meaning with regards to computers and the Internet as part of their everyday experience and how does this relate to developmental adaptations to ageing?*

2. *What is the process by which computers and the Internet become integrated into older people's everyday lives?*

Whilst studies focussing on older people's *adoption* of computers and the Internet are common (e.g. Compeau and Higgins, 1995; Venkatesh and Davis, 1996; Rogers et al., 1998) and their *domestication* (Hynes and Rommes, 2006) and *familiarisation* (Turner, 2008) are beginning to be explored, at no point has this connection been made between adaptations to ageing and adaptations to technology use (i.e. appropriation). A full exploration of older people's appropriation of computers and the Internet in the context of adaptive ageing would provide an important resource for those developing accessible computer and web-based applications for older people, those involved in supporting and training older people as part of digital inclusion initiatives and those interested in developing accessible online public services.

Chapter 4 - Methodology

Covered in this chapter:

This chapter provides a description of the overarching methodology used throughout the thesis as well as specific detail in relation to the methods and analytical decisions for each case study. In each case examples of coding and justifications for sampling are given along with interpretive and ethical considerations.

Overarching Methodology

The research contained within this thesis pursues its aims using a qualitative, longitudinal and inductive approach guided by grounded theory (Glaser and Strauss, 1967; Glaser, 2001) and employing research strategies derived from ethnography and ethnomethodology. As such it has sought to access the everyday experiences of older participants and to provide in-depth accounts of subjective and contextual meanings in relation to computers and the Internet ultimately generating a theoretical framework which can explain their engagement with these technologies.

Grounded theory provides a set of general principles for simultaneously guiding investigation, data collection and analysis of qualitative data in order to construct theory whilst maintaining an intimate awareness of participants' 'situated' understandings. This made it useful in this thesis in terms of guiding ongoing ethnographic data collection and helping to steer it towards theoretical interpretation (Charmaz and Mitchell, 2001).

Ethnography seeks to paint a detailed picture of participants' daily lives and to understand social contexts 'from the inside'. This is principally done by researchers involving themselves deeply in the context under study and taking on roles that allow them to gain insights into participants' subjective modes of understanding. The centrality of this approach will become clearer in the later discussion of methods in relation to each study. Ethnomethodology (Garfinkel, 1967) adds another dimension to an ethnographic study by sensitising enquiry to individuals' active constructions of their social order. In this thesis there is a concern with the commonsense ways that older people achieve ongoing social order through their interactions with computers and the Internet along with the communicative acts that take place through them. Related to this approach and perhaps

more relevant to studies of technology is the notion of 'situated action' (Suchman, 1987) – the idea that people's behaviour in situations which involve human-computer interactions are driven not by prior rational planning but emerge contingent upon the actions of others and become intimately linked to the creation of the said 'context'. So in this thesis the relevance and benefits of computers and the Internet are not assumed to be something that is defined solely by technical function established prior to adoption but are emergent properties of the ongoing relationship between older people, computers and the Internet, arising out of their ongoing involvement with these technologies and the social contexts that exist around them.

By examining the emerging psycho-socio-technical relationships between older people, computers and the Internet in different contexts and with a range of users, it is possible to establish patterns in the data which show persistent qualities of these relationships. A number of different data collection methods are used to crystallise (Richardson, 2000) an understanding of these emerging relationships in terms of different participant perspectives, gathering data from offline interviews and observations as well as through analysis of online interactions. Through grounded analysis the data is coded and ultimately framed around the notion of appropriation. The different contexts used in this thesis allow examination of the impact of social context on these emerging psycho-socio-technical relationships in a number of ways: a) in terms of participants' different degrees of independence reflected in their living arrangements, b) through the availability of learning support to them and c) through participants' immersion in offline versus online social contexts. They also allowed examination of these emerging dynamics over time.

Four different case studies are used as the basis for grounded analysis and these are presented in the thesis in the following order:

- 1) The Newhaven Study (Chapter 5) examines computer and Internet engagement as an aspect of everyday home life for older people living independently in the community. Here consideration is given to the ways in which awareness and learning about such technologies appear in the everyday lives of older people as part of their ageing experience. Participants in this study were already engaging with computers and the Internet to varying degrees.
- 2) The Age Concern Drop-in Centre Study (Chapter 6) considers computer and Internet engagement as part of a learning experience in a community setting away from home where the context is clearly defined as being about learning to use computers and the Internet. In this study user engagement is tracked over time.

- 3) The Geriatric1927 YouTube Study (Chapter 7) examines one older user's sustained engagement with the YouTube website in depth with a longitudinal study spanning three years and four months. Here the participant, Peter Oakley (YouTube name Geriatric1927), lives independently in the community but becomes immersed in an online social context. It is here that the study's primary focus lies.
- 4) The Nintendo Wii in Sheltered Housing Study (Chapter 8) looks at use of the Nintendo Wii game console within sheltered accommodation where there is a greater degree of dependence amongst the participants and their previous engagement with computer-based technologies is limited. This is also a longitudinal study of use over the course of one year. The following table shows a breakdown of the different studies in terms of these contextual variables.

Table 2: Contextual variables of the four studies in the thesis

Study	Degree of Independence	Learning Support	Social Context of Use	
			Offline	Online
1.Newhaven Study	Fully independent	Family and friends	Isolated use	Variable (mostly email)
2.Age Concern Drop-in Centre	Fully independent	Proficient volunteer	Shared with peers	Variable (mostly email)
3. Geriatric1927 YouTube Study	Fully independent	Occasionally family and friends but mostly from online contacts	Isolated use	Well developed (email, Skype and social networking)
4.Wii Study	Daily living support available	Paid proficient charity support staff	Shared with peers and carers	Not applicable

It should be made clear at this point that although the studies are presented in this order within the thesis this does not reflect the order in which they were conducted but rather the logic of the grounded analysis that guided investigation. The reasons for this will now be explained along with specific methodological detail for each study.

The Age Concern Study (Chapter 6) and Initial YouTube Study (Part 1 of Chapter 7)

An ethnographic approach shaped early research with the researcher becoming a volunteer helper at an Age Concern computer drop-in centre for older people in Brighton seeking to understand older users' engagement with computers and the Internet through conversation, interviews and participant observation within the context of use. This particular study setting was chosen as a 'typical' starting point for an older person wanting to learn about computers and the Internet and provided opportunities for understanding early encounters from an older person's perspective. Conversely the Geriatric1927 YouTube study was started at around the same time because of its 'atypical' nature, involving an older user in a youth-dominated online environment. Virtual involvement with the YouTube community through participant observation also informed data collection methods in relation to Geriatric1927's use of YouTube. Here the researcher acted as a YouTube video blogger, making and responding to videos as part of the process of coming to understand Geriatric1927's involvement with this online medium. From an ethical perspective it was important to make clear this research emphasis to all those encountered via YouTube and at every opportunity this was reiterated. There were of course limitations to obtaining a complete 'insider view' because of this necessary statement of intent. In addition there were limitations to appreciating an older person's perspective directly as the researcher was only in his forties and not an older person himself.

Data collected from the Age Concern study was in the form of field notes of observations and contextual interviews undertaken during three hour weekly sessions at the drop-in centre. The researcher attended these sessions for a period of one year providing computer skills support to enable users to achieve their own self-determined aims. Computer users were informed about the research and where possible, engaged in discussion about their reasons for coming to learn about computers and the Internet. In Geriatric1927's case the data collected was in the form of video and textual dialogues generated by his first eight videos. Here the verbal content of his videos was transcribed into text form along with the text comments received from his viewers and analysed using grounded theory. The videos were also repeatedly viewed and analysed for non-verbal issues beyond the transcripts of the videos such as the production values of the videos.

Open coding (Glaser and Strauss, 1967) or initial coding (Charmaz, 2006) marked the beginning of the analytic process for grounded theory: the process of working through the

data to separate out the significant semantic elements contained within interactions, clarifying the actions and intentions of participants and seeking underlying meanings. Observations from the Age Concern study were coded instance by instance, revealing older participants' activities and expressed attitudes towards computers and the Internet. Through subsequent focused coding (Charmaz, 2006) the commonalities and differences between accounts were rationalised into different categories. Two broad categories appeared in the data which helped to explain the underlying meanings of these interactions for participants. These were 'reasons for attending the centre' and 'problematic computer activities' each of which were further subdivided as follows:

Table 3: Initial coding scheme for Age Concern study

Category 1: 'problems encountered at initial use'		Category 2: 'reasons for attendance at drop-in centre'	
Subcategories:	'cognitive understanding'	Subcategories:	'becoming competent with the technology'
	'physical interaction'		"providing social contact with family and friends"
			"peer pressure"
			"unsure"

The following extract is an example showing focused coding of the field notes:

Table 4: Example of initial coding from Age Concern study

Category	Observational field notes
'problems encountered at initial use' - 'cognitive understanding' (memory)	14 th February 2007: Helped two ladies who had visited the previous week to get to grips with their email. They were struggling to remember what was a username and what was a password. Even though they had written them down the previous week there was still a great deal of confusion. One of the ladies wanted to send emails to her grandchildren in New Zealand and the other to her son in China (he was teaching English there)
'reasons for attending' - 'providing social contact with family and friends' (geographically distant)	

Initial coding of Geriatric1927's YouTube videos and comments took place on a word by word basis dealing with content which was embedded in a YouTube-mediated discourse. This yielded categories distinct from the Age Concern ones through focused coding.

Examples of this coding are shown below. For more detail on this analysis see Harley and Fitzpatrick (2009a).

Table 5: Example of initial coding from YouTube study

Category		Example YouTube comments
'evolving community through discourse'		<i>"You are the kind of person this bloody thing is crying out for"</i> [Pd, 34, UK – response to Video 4]
'co-creation of content'		<i>"tell us about what life ws [sic] like growing up during the war"</i> [Is, 20, UK - response to Video 2] [the war]
'learning technical skills and how to be a YouTuber'		<i>"Dont worry, to get your videos noticed, post them as a responce [sic] to other peoples videos"</i> [Fb, 26, Canada - response to Video 2]
'personal and emotive responses'		
Subcategories:	'video compliments'	<i>"Look forward to viewing more of your videos"</i> [bm, 23, US – response to video 4]
	'positive emotional responses'	<i>"I wish you were my grandpa :)"</i> [Jx, 21, US – response to Video 3]
	'playful or teasing responses'	<i>"haha you go old geez"</i> [v6, 17, US - response to video 2]
	'negative emotional responses'	<i>"I can't see why this guy is so popular –it's boring- dull, depressing, meaningless"</i> [Mk89, 24, US – response to Video 4]
	'age related comments'	<i>"I know many 40 year olds that can't find the power switch to a computer. I think its great that you are showing such "thirst for knowledge" of exciting new tech that you could very well ignore. Keep the videos coming."</i> [Bk,19, US – response to Video 2]

To validate these categories in lieu of Geriatric1927's subjective experience a semi-structured interview was conducted with him on 7th August 2007 at his home. This interview sought to understand his early experience of YouTube to supplement and validate the analysis of online interactions. The interview covered the journey that he had made to first using YouTube, how he had acquired the skills and what had motivated him to start using the website. It also asked how YouTube had affected his existing friendships and provided new social opportunities (see appendix D for the interview guide).

These first two studies yielded quite different and seemingly divergent ways of understanding older people's engagement with computers and the Internet, reflected in the categories developed. The users at Age Concern were experiencing problems relating to early motivations for adoption and the acquisition of basic skills whilst Geriatric1927 was already fully engaged with the Internet exercising reasonably established skills in pursuit of social and creative aims. These differences showed a continuum from the inexperienced and barely motivated user to one who was deeply engaged. Implicit in this continuum was the idea of a potential (hidden) transition. A transition that occurred over time, involved learning and the tailoring of a computer's purpose to individual circumstances and interests. At this point in the research process consideration of the literature revealed *appropriation* (e.g. Dourish, 2003; Salovaara, 2008) as a potential vehicle for framing such transitions and as a valid core category upon which to base further investigation and analysis. This might seem to contradict the grounded approach being taken but as Glaser and Strauss (1967, p. 253) point out,

The core categories can emerge in the sociologist's mind from his reading, life experiences, research and scholarship...no sociologist can possibly erase from his mind all the theory he knows before he begins his research. Indeed the trick is to line up what one takes as theoretically possible or probable with what one is finding in the field.

Identifying appropriation as a core category had implications for the ongoing research in terms of both *theoretical sampling* and *axial coding*. Theoretical sampling is a strategy used within grounded theory to elaborate upon specific categories that have emerged from early investigation and analysis. In this thesis subsequent studies were deliberately chosen to elaborate upon appropriation at different points along the transition extending prior studies into the future and adding further studies to explore appropriation dynamics in different contexts and at different points along the appropriation continuum. Two further studies were embarked upon (the Newhaven study-chapter 5 and the Wii study-chapter 8) to include older participants with different motivational stances and degrees of engagement with computers and the Internet (from rejection and ambivalence to deep engagement). Geriatric1927's YouTube study was also extended to ascertain ongoing features of the appropriation continuum further into deep engagement.

Axial coding is used within grounded theory as a way of recombining categories already developed through initial and focused coding around a new core category. In this thesis axial coding was used to reorient earlier codes (i.e. those from the Age Concern drop-in

study and the study of Geriatric1927's first eight videos) around appropriation as a new core category and to move analysis towards a final theoretical framework (see appendices B and C). Subsequent studies were coded in a similar fashion maintaining this emphasis on appropriation. The way in which the studies are presented in this thesis reflects the logic of this axial coding, i.e. they are presented, not in the order that they were done (not chronologically) but in an order that makes explicit the different phases of the appropriation transition over time. In addition the categories described in each chapter are those developed through axial rather than focussed coding.

The Newhaven Study (Chapter 5)

In the Newhaven study a group of older people were interviewed in their own homes about the role of computers and the Internet in their lives ascertaining their appropriation of these technologies post retirement. Interview participants were recruited from the Newhaven and Peacehaven areas in the South East of England which has a high proportion of older people. The interviews were semi-structured and lasted about an hour (see appendix A). Initial coding of the transcribed interviews was conducted line by line and through axial coding and constant comparison the data was related to previously established categories relating to appropriation as shown in table 6.

The structure of the emerging appropriation framework began to appear as part of this analysis through the motivational subcategories of 'personal sense of purpose' which later became refined to 'themes of relevance' and the temporal subcategories of 'phases' showing the transitional aspect of appropriation. In addition to the axial coding around 'appropriation' another category of 'the experience of ageing' was also identified in this study. This coding was influenced by the literature on ageing and marked an initial recognition of adaptive ageing models as relevant to the analysis. Whilst this appeared as an explicit category in this study it merged with the ongoing analysis of appropriation in subsequent studies as an apparent synthesis between personal adaptations and those occurring through computer and Internet use.

Table 6: Example of axial coding from Newhaven study

Category: Appropriation (core)			
Subcategories:	'personal sense of purpose' (themes of relevance)	social contact	"So I mean, they can email me, isn't that marvellous? there must be an internet cafe out there and they go and email me when it's nearly time for their next lot of money (laughs) so it's very important to me" (Sylvia)
		creativity	"I use www.Musicroom.com and it's amazing, it can come the next day" (Maureen)
	'phases'	rejection	"I think if I'm now 87 it would probably take about 5 years to learn, I don't think it would be an appropriate thing to do, why bother. So I will remain computer illiterate" (Arthur)
		adoption	reluctant "I might go on there and see if I can find a phone number but it doesn't interest me" (Evelyn)
			committed "you all pile into Facebook and somebody says there is a party going on let's see if we can get a group to do it" (Jeffrey)
		deep engagement	"you know I think photography all the time. Whenever I'm out somewhere, even on the bus or something I'm looking out thinking 'oh wow, I'm passing a photograph'" (Sylvia)

The Extended YouTube Study (Part 2 of Chapter 7)

The extended study of Geriatric1927's YouTube engagement covered a period of three years and four months analysing the 226 videos that he posted between August 3rd 2006 to 31st December 2009. Two different methods were used to gather data in relation to these videos: genre analysis (Riemer and Filius, 2009) and multimodal interactional analysis (Norris, 2004). Both maintained a grounded approach to analysis which continued to emphasise appropriation as the core category. Genre analysis provided a means of differentiating Peter's appropriation of YouTube over the whole period on the basis of 'use genre' (Bakardjieva, 2005), i.e. the evolution of Peter's video making practices into distinctive forms of self expression and social expectation. Analysis was conducted video by video with initial coding producing a 'genre repertoire' (Riemer and Filius, 2009) which catalogued all the genres used by Peter during this time, showing how 'typical' uses

of YouTube were co-constructed amongst YouTubers, evolving over time as appropriation deepened. Each genre was taken to illustrate a distinct sense of relevance and purpose defined by Peter and his viewers in relation to his YouTube engagement.

Given the highly interpretive nature of this kind of qualitative analysis, these genres were then clarified in interview with Peter, checking their validity and meaning to him. This second interview was conducted via the Internet using video conferencing software (Skype) and took place on 13th January 2010. It was also used to document changes in Peter's offline world and the impact of YouTube involvement on his everyday life (see appendix E for the interview guide). The frequency and timing of the videos within each genre along with their qualitative descriptions was taken as the basis for further grounded analysis. Through axial coding each genre was related to appropriation in terms of different phases over time and the themes of relevance already developed:

Table 7: Example of axial coding from extended YouTube study (genre analysis)

Category: Appropriation (core)			Genre
Subcategories:	'themes of relevance'	social contact	YouTube related; Promoting older people's involvement in modern culture;
		creativity	Reminiscence and life history; Readings or scripted performances; Filmed naturalistic events;
		intergenerational connection	Reminiscence and life history; YouTube related; Advice or educational content; Reflections on modern life, news or world events;
		reminiscence and life review	Reminiscence and life history
	'phases'	rejection	not applicable
		adoption	Test videos; YouTube related
		active learning	Reminiscence and life history; YouTube related
		deep engagement	Reflections on modern life, news or world events; Promoting older people's involvement in modern culture; Readings or scripted performances; Filmed naturalistic events; Personal reflections on everyday life and the experience of being 'old'; Advice or educational content

Whilst the idea of different phases to appropriation was apparent at this stage the transitions between each of the stages were less clear. A multimodal interactional analysis (Norris, 2004; Kress and Leeuwen, 2001) of one of Peter's YouTube video blogging dialogues was undertaken to see how YouTube's multimedia resources were being used to construct meaningful interactions and what part these might play in transitioning between appropriation phases. Multimodal interactional analysis acknowledges the different ways in which meaning is conveyed and constructed in communication beyond the sole use of language. Examination of video blogging in this way therefore gave a fine grained, holistic account of the interactions which incorporated not only language but also body posture, gestures, layout of filmed settings, the sound qualities of speech, editing of the video, etc; in fact anything that was used to convey meaning through YouTube's visual medium. A multimodal interactional analysis shows how Peter and his fellow vloggers through their actions, structure the awareness of their viewers by directing their attention towards particular aspects of the interaction and hence signify communicative intent.

Grounded analysis of multimodal data requires a different approach to that taken with text-based data. Initial coding was done on the basis of multimodal utterances (e.g. periods of silence or eye contact, title sequences, etc.) and semantic content was not always easy to articulate in words at first viewing. It was only through focussed coding and repeated viewings that the significance of repeated occurrences of multimodal behaviour became clear and could be articulated into distinct categories. Again this was a highly interpretive process and the video bloggers involved were consulted about the validity of this analysis throughout. Active participation in the process of making and viewing video blogs was also necessary for an appreciation of the implications of video bloggers' use of multimedia resources. Axial coding of the video blogging dialogue is shown below.

Table 8: Example of axial coding from extended YouTube study (multimodal content)

Category: Appropriation (core)				
Subcategories:	'themes of relevance'	social contact	Turn-taking	Eye contact; silent pauses in speech; playback of recorded speech
			Negotiating simultaneous audiences	Placing of objects in background; use of physical props

Below is an extract from excerpt 1, part of the full multimodal transcript developed for Geriatric1927's YouTube video dialogue. The transcription conventions are borrowed from conversation analysis (ten Have, 1999) and have been adapted to incorporate other relevant actions. Along with accepted conventions⁵, the transcribed speech is annotated to show periods of camera eye contact in **bold**, and notes about observable actions in bracketed *italics*.

Extract from Excerpt 2



00:43:00

P: his question says teenagers more regularly have contact with drugs and alcohol despite **laws preventing this** do you believe that it is enty- sorry, (*starts to emphasise speech by waving his left hand up and down*) do you believe

Such extracts are used in this study to convey the sense of eye contact (shown here in bold text) being used as part of turn taking and dictating the way in which social contact progressed.

The Wii Study

The Wii study also used multimodal interactional analysis to track appropriation of computer-based technologies (this time Nintendo Wii gaming consoles) by older people in sheltered housing schemes over a period of one year in Brighton and Hove. This study was used as a way of validating the previously developed phases of appropriation and to add a multimodal dimension to understanding the whole process. Multimodal interactional analysis was supplemented by participant observations and interviews at game playing sessions in order to ascertain longitudinal changes in the person-technology dynamics expressed through game play and the broader social context that supported it. In this study data collection was shared with other researchers⁶ but analysis was conducted by the author of this thesis in line with its research aims. Initial and focused coding was done in the same way as for the YouTube multimodal interactional analysis, remaining open to new expressions of appropriation which emerged. In this study multimodal behaviours

⁵ Speech conventions: (n) pause noted in seconds; = joining of words; : an extension of the preceding syllable; ↑↓ rising or falling intonation for subsequent utterance; underlined text indicates spoken with particular vocal energy; - a sudden cut off to an utterance; ? a rising tone; . a falling tone; , a shifting continuous tone bridging utterances

⁶ see other authors of Harley et al (2010)

were seen to fit within Goffman's (1963) notions of 'sacred space' and 'decorum' and these dictated focused codes. Axial coding highlighted the use of multimodal resources again as defining aspects of 'social contact' but also in relation to other 'themes of relevance'. After axial coding, constant comparison (Glaser and Strauss, 1967) was used to validate the themes and phases of appropriation established in previous studies. Examples of this coding are shown below.

Table 9: Example of axial coding from Wii study (multimodal content)

Category: Appropriation (core)				
Subcategories:	'themes of relevance'	social contact	sacred space	position of chairs; shared silence; respect for central space; attention to player
			decorum	group encouragement
		acquiring knowledge	sacred space	shared silence
			decorum	sharing embodied movements
Subcategories:	'phases'	adoption	sacred space	placing of chairs (by Age Concern organisers)
			decorum	attention to player – silence when playing
		active learning	sacred space	placing of chairs (shared by staff and residents)
			decorum	attention to player and staff - silence contested
		deep engagement	sacred space	placing of chairs (by players)
			decorum	attention to all present – no silence

Below is an extract from excerpt 3, part of the full multimodal transcript for one of the sheltered houses in the Wii study.

Extract from Excerpt 3



0.41.92

Dee: (demonstrates throwing movement) n let go-

Edna: (successful throw) Dee: hey that's a good one↑

Ann: cor: that's a good one↓ Edna↑ hurray:, one left.

Dee: ha ha ↑

Beryl: Huhmm.

(9)

The still shot from this extract shows how the placing of chairs around the Wii console created a 'sacred space' for learning new technical literacies at adoption.

Interpretive and Ethical Considerations

The analysis of data was highly interpretive. To ensure the internal validity of the categories that were developed in relation to appropriation a participatory approach was taken throughout, engaging participants as much as possible in the interpretive process, revisiting data in a collaborative manner with participants along the way to ensure its phenomenological validity. The process of focused and axial coding was further elaborated and clarified through ongoing email contact with study participants and through comparison across the different case studies. In Geriatric1927's case an ongoing rapport was developed with him through ongoing email contact and impromptu Skype conversations which allowed for a greater mutual understanding.

There were also important ethical considerations relating to participant involvement that were an intrinsic part of this research. This related particularly to the older people consulted here as they were potentially a vulnerable group. Informed consent was gained at all times from participants before engaging them in overt research. This was the case for all the older people taking part in the Age Concern study, the Newhaven study and the Wii study. All were given information sheets and consent forms to sign prior to participation (see appendices G and H for examples). Ongoing collaboration with Age Concern staff and the Meridian Mature Citizens Forum helped to ensure participant empowerment as central to the research process. It was made clear to participants that they could withdraw from the research at any point and they were reminded of this whenever audio or video recording was involved. All verbal contributions were anonymised. The only exceptions to this rule were the images that made up the multimodal interactional analysis. Again explicit permission was gained to conduct this analysis from participants and the names were again anonymised as part of transcription.

The YouTube studies differed in some respects. Whilst informed consent was gained directly from the participants involved in the multimodal interactional analysis (and where appropriate from parents), the sheer volume of participants involved in the earlier textual analysis made the process of gaining informed consent impractical. The view was taken that this data existed in the public domain and did not constitute an infringement of privacy. Usernames were anonymised however.

No incentives were used to engage any of the participants.

Chapter 5 – The Newhaven Study

Covered in this chapter:

This chapter reports on a qualitative study examining computer and Internet engagement as an aspect of everyday home life for those living independently in their own homes in the South East of England. In this instance learning support was only available from family and friends (if at all). The social context of use was primarily one person to one computer and social connections online were variable. Semi-structured interviews were undertaken to explore experiences of growing older in the UK and the role that computers and the Internet had played in the post retirement transition. The intention of this study was to elaborate upon the broad social context which influenced and informed older people's appropriation of computers and the Internet, primarily the adoption phase but covering further appropriation as well.

Introduction

In the developed world it is becoming increasingly common for older people to live in their own homes into advanced age. This move to 'independent living' for older people (e.g. EC 2007a) or 'aging in place' (e.g. Mynatt, Essa and Rogers, 2000) acknowledges the importance of autonomy, self-reliance and self-determination in maintaining quality of life for older people and has become a cost effective means of caring for increasingly ageing populations. Computers and the Internet potentially have a role to play in supporting older people to live longer in their own homes which makes the home context an important one to understand with regards to their appropriation of these technologies. This study therefore examines the experience of computer and Internet appropriation as an aspect of older people's independent living in the home context. Important elements to understand here are the sources of information that raise older people's awareness of computers and Internet use and the ways that they establish relevant, beneficial and personally meaningful use. In particular the fit between adaptive approaches to ageing and appropriation of computers and the Internet is examined.

Background/Setting

This study focuses on the experiences of a small group of retired older people living independently in the communities of Peacehaven and Newhaven in the South East of England. All of them live unassisted in their own homes and their ages range from 63 To 87. Two of the participants live in houses which are part of housing schemes designed specifically for older people whilst the remaining seven live in housing areas with mixed age ranges. A breakdown of the characteristics of the different participants is shown in the following table:

Table 10: Characteristics of participants in the Newhaven study

Name	Age Group	Housing	Living Arrangements	Car owner	Mobility Concerns	Computer owner
Sylvia	60's	Retirement housing scheme	Lives with and cares for spouse with mental health needs	No	Cannot leave her husband for extended periods	Yes
Jeffrey	70's	Standard mixed-age housing	Lives alone	Yes	Recently had a hip replacement	Yes
Maureen	60's	Standard mixed-age housing	Lives with spouse	Yes	Has ongoing physical ailment (undisclosed)	Yes
Evelyn	60's	Standard mixed-age housing	Lives with spouse	Yes	Suffers from extreme Repetitive Strain Injury	Yes
Bill	70's	Standard mixed-age housing	Lives alone	No	Brain injury	Yes
Jill	70's	Standard mixed-age housing	Lives alone	Yes	Fit and active	Yes
Kathy	70's	Standard mixed-age housing	Lives alone	Yes	Fit and active	Yes
Jane	70's	Standard mixed-age housing	Lives alone	Yes	Fit and active	Yes
Arthur	80's	Retirement housing scheme	Lives with spouse	No	Has ongoing mini-strokes	No

Volunteer participants were sought from the Newhaven and Peacehaven areas in the South East of England which has a high proportion of older people. This was done through the Meridian Mature Citizens' Forum which "promotes the welfare and interests of older people within the Meridian Coast and Downs area as well as providing a platform where

matters of concern to older people can be raised and the relevant policies developed”⁷. Interviewees were recruited via their newsletter which is delivered to interested older people throughout the area. In all 9 people volunteered and they were contacted by telephone to be interviewed in their own homes. The research also formed part of a collaborative project with the University of Brighton called Activity Buddies⁸ funded by the Higher Education Funding Council (HEFCE) and South East Coastal Communities (SECC) which sought to involve undergraduate students in research with older people. The interviews were therefore conducted in conjunction with one of these students and lasted about an hour. They were semi-structured with questions emphasising the experience of growing older as well as decisions about computer appropriation during retirement. This was done with a view to situating appropriation within the context of the participants’ lives and the experience of ageing. Interviewees’ names have been anonymised throughout.

Findings

The appropriation of computers and the Internet for this group of older people is understood in this thesis as taking place within the broader experience of ageing. Aspects of this broader experience are presented first by way of giving context to the subsequent examination of computer and Internet appropriation.

The Experience of Ageing

Whilst there was acknowledgement of the physical and mental ‘deficits’ of ageing amongst the interviewees these did not dominate discussion and interviewees made a point of not allowing them to do so. The ongoing effects of ageing were experienced as a gradual lessening of abilities and fitness which were apparent as ‘just getting older’ (Jill) but equally had to be constantly fought against through physical and mental activities,

You’ve got to keep yourself busy. It’s use it or lose it I always say (Jill)

For some the worst experiences of ageing had been brought to the fore by critical injuries or illnesses which had threatened their gross mobility. For instance Evelyn suffered from

⁷ Taken from the Meridian Mature Citizens’ Forum website (<http://www.meridian-sf.org.uk/index.html>)

⁸ <http://www.brighton.ac.uk/sohp/research/groups/activitybuddies/index.php>

severe repetitive strain injury after using computers for the last few years of her working life and had been immobilised at times through the need to have surgical treatment. Jeffrey had recently had a hip replacement operation, Bill had been involved in a car crash suffering a brain injury which had hastened his retirement in his 50's and Arthur had suffered a heart attack post-retirement and continually experienced mini strokes. Occasions of being confined to home through infirmity had brought on temporary feelings of isolation,

You can feel isolated even though you do have a lot of people around you when you're stuck (Evelyn)

Interestingly, whilst all but two of the interviewees lived alone or spent extended periods of every day alone this was not seen as a problem on a day to day basis. None of those interviewed had any prolonged uncomfortable feelings of isolation or loneliness suggesting that a feeling of control over degrees of social contact was important. All of the interviewees enjoyed being alone, deliberately seeking out solitude. This is in line with gerotranscendence research (Tornstam, 1996; 2005) which sees 'positive solitude' as important in adjusting to later life. As one interviewee commented when asked about feelings of isolation,

I feel isolated to the extent that I am a natural born recluse (Arthur)

and

I love living on my own. I've always been able to keep my own company. I don't have the television on much, I don't have music on or anything like that I'm quite happy sitting reading doing the crosswords things like that (Jeffrey)

Fears about future isolation were expressed through their experiences of other people who were older than themselves. The finite nature of life and of their personal resources was evident to them in relation to these others. This was expressed as fears for the future in terms of expectations of poor physical health and reduced social contact as a consequence of reduced mobility. This was particularly in relation to the anticipated loss of access to car travel.

Changes in Attitudes

For the most part the experience of selfhood remained constant despite physical changes,

I mean I'm physically able to do most stuff, my brain doesn't think any different. That's what I mean, you look at someone that's elderly and you think that they think differently but they don't. I'm sure we are all the same (Evelyn)

However it was evident that the experience of ageing and limited personal resources had brought changes to individual attitudes and approaches to life. There was now an urge to hone one's life down to only 'the important things'. As Bill explained,

I'm doing a lot of things and I say to myself I should do fewer things better
(Bill)

This kind of selective narrowing is akin to the selectivity described by Baltes (1993) as part of his adaptive approach to ageing. Other expressions of selectivity were evident in terms of who the interviewees wished to have social contact with, their choice of daily activities and even the emphasis of conversations, preferring matters of serious intent,

I don't feel like I owe it to people to sit and talk, gossip, a load of rubbish. If someone has got something sensible to say to me then good and I will answer but if they talk a load of chat I'm not interested (Arthur)

This preference for 'serious' conversation echoes some of the tenets of *socioemotional* selectivity theory described by Carstensen (1992). Arthur's concerns were directed towards emotional salience rather than acquiring information and this was related to his perception of time as a finite resource which is also a feature of this theory (Carstensen, 1999).

Overall there was a wish to spend quality time with friends, family and neighbours but also to maintain a healthy balance between engaging with others and keeping one's own company. Particular close social contacts had become the focus of life and an ongoing sense of purpose was tied up with continued involvement with these people. These were described as 'family' but were not always defined by blood ties. Other notions of kinship were apparent relating to like-mindedness in friends and daily familiarity through physical closeness. Defining and maintaining these family ties (however that took place) had become a central concern in everyday life. Communication technologies were seen as playing an important role in maintaining these 'family' connections when they existed over great distance. Even for the committed adoptees of computer technology this took place primarily by telephone. Alongside this was a growing appreciation of immediate sources of local support and the necessity of local community involvement, belonging and a strong sense of local interdependence.

Another way in which the interviewees adjusted to their particular experiences of ageing was by reorienting their view of life and turning initial perceptions of loss into positive challenges and opportunities. This showed itself in terms of an ongoing life review, the cultivation of particular attitudes and the development of new roles in retirement. Life review was often brought to the fore by particular life threatening events in old age,

One result of the accident [which happened in his fifties] was to make me think with introspection what's life all about, how to make it worthwhile. I must admit before I had the accident I never really thought that way (Bill)

In lieu of such considerations some of the interviewees were also in the process of reviewing the materialist culture in which they found themselves, attempting to pursue a frugal and austere way of life in response.

All the interviewees had increased their involvement in their local community post retirement and it was unanimously suggested that an outgoing and sociable attitude was really important to cultivate in order to find one's place again after retirement. As Bill put it,

I had a need to feel needed (Bill)

The interviewees had joined local community centres as Trustees, volunteered as befrienders and carers to older old people in their local area, as mediators in local prisons, legal advisors for local community groups and all were members of the local Mature Citizens' Forum. Those with grandchildren had increased their caring roles and responsibilities.

It should be noted at this point that the interviewees were recruited through one particular community-oriented organisation, the Meridian Mature Citizen's Forum, which may give a particular bias to this sample in terms of their community-oriented perspective.

Appropriation of Computers and the Internet

The interviewees had all reached quite different stages with regards to the technology appropriation process. Four relationships were identified in this group with regards to computers and the Internet. They were *rejectors*, *reluctant adoptees*, *committed adoptees* and *deeply engaged*. Of the nine people interviewed, eight had computers of their own (i.e. were adoptees) and one had never owned or used a computer (the *rejector*). Three of those with computers were regular daily users having integrated them significantly into

their everyday lives (the *committed adoptees*). They were also advocates for computer use by others and one of these *committed adoptees* was also an adept user who pursued her passions through the computer (*deeply engaged*). The other five, whilst adopters of the technology, did not view computer use as an enjoyable or preferable activity and were reluctant to even turn their computers on (the *reluctant adoptees*). The participants framed computer and Internet use in quite different ways depending upon their particular experiences of ageing and how far they had already gone down the appropriation route. In different ways the selectivity of different individuals was expressed through their attitudes towards computers and the Internet.

Rejectors

The single example of computer and Internet rejection revealed a life affirming decision rather than a recognition of defeat or an inability to learn about the technology. Arthur was knowledgeable about electronics, still fixing electronic appliances at home for his friends. He was therefore quite capable of learning how to use computers but had taken a stance towards computerised technology earlier in his life which reflected an independent and self-sufficient attitude towards technology,

I had to make a really big decision at one certain stage, quite a good few years ago and it was a case of should I continue working in discrete electronics or would I join the computer club which is, you don't do any repairs because you don't know how it works, you can work it and you can use it but these guys they don't really know what is going on inside it (Arthur)

Arthur knew that he could learn how to use computers in time but reflecting on his failing health and his own mortality he had decided that this would not be time well spent. His immediate concerns were to spend quality time with loved ones and by himself. Arthur's perception of time as a finite resource to be used wisely had clearly affected his decisions to reject computers,

I think if I'm now 87 it would probably take about 5 years to learn, I don't think it would be an appropriate thing to do, why bother. So I will remain computer illiterate (Arthur)

Socio-emotional selectivity theory (Carstensen, 1999) suggests that it is this subjective sense of limited future time that steers older people towards more social and emotional goals and away from acquiring new information (Carstensen, 2006) as learning about computers would inevitably entail. This certainly seems to be the case for Arthur. Periods

of silent contemplation and meditation had also become very important aspects of Arthur's daily routine and computers were not seen to support or enhance this in any way. This reflects a gerotranscendent attitude (Tornstam, 2005) towards positive solitude which also worked to negate any involvement with computers.

Adoptees

Eight of the interviewees had adopted computers and the Internet at some point prior to the interviews. Three of these had moved on to greater appropriation (*the committed adoptees*) whilst the other five remained *reluctant adoptees* choosing not to develop their use of the technology any further because of early disenchantments. Overall the framing of adoption at home was dictated by a number of factors:

Computers as Work Machines

All except one of those who had adopted computers had first encountered them at work. In retirement computer use amongst the reluctant adoptees remained work-focused being used to acquire factual information, to deal with administrative duties such as paying bills or to keep informed about voluntary group activities and responsibilities via email. Overall this involvement was of a very functional nature concerned with logistical arrangements and the gathering and sharing of practical information rather than as a medium for informal communication or enjoyable activities. In all these cases the computer was tucked away in areas apart from the central living spaces either in rooms designated as offices or tucked away in drawers that contained administrative paper work. Computer activities were aligned with solitary tasks where productivity remained important. As one interviewee explained,

Well to me the computer is a business thing (Kathy)

Whilst reluctant adoptees retained a strong association with them as work machines they also remembered these earlier experiences as being quite uninspiring and in one case the direct cause of disability (Repetitive Strain Injury),

at one point I had about 3 computers on my desk and when I left I mean I wrecked my hands working.....It doesn't interest me at all I just can't I dunno. I might go on there and see if I can find a phone number but it doesn't interest me (Evelyn)

Intergenerational Understanding/ Relating to the Younger Generation

Another impetus to adopt and understand computers across all the adoptees was so that they could relate to the world as experienced by the younger generation and become

informed about it. This was primarily encountered through discussions about grandchildren and great grandchildren. For instance Jill would often look after her young grandchildren at their house when their parents were out for the evening and would be responsible for overseeing their computer use. As she explained,

they were allowed half an hour each on the computer of an evening and whoever had the computer first the other one chose the program and they took turns (Jill)

When her grandchildren visited her at her own home she was also very careful to monitor their computer use,

Interviewer: *"Do your grandchildren use it?"*

Jill: *"Oh no no they're not allowed to touch it.. My grandsons are five, in fact there is a bolt on the door because I have work on there."*

Interviewer: *"Oh, no, I meant the internet have they got their own computers?"*

Jill: *"No not yet, I mean they will do eventually. I have a cam so the boy can talk to my granddaughter. My other [older] granddaughter is quite a whiz on the computer. My son knows what he is doing but pretends he doesn't"*

Engaging with the younger generation inevitably means dealing with computers and the Internet in some way as they are so prevalent amongst this age group. Computers clearly played a large part in the lives of Jill's children and grandchildren and she was keen to be able to participate more fully in their lives through this same medium. Intergenerational contact was also a feature of Jeffrey's and Sylvia's computer and Internet use. The intergenerational context has also been a feature of other studies (e.g. Kantner and Rosenbaum, 2003; Hynes and Rommes, 2006). Older users may show interest in learning about computers and the Internet as a way of encouraging younger relatives to use them. This may be because of the improved job and education prospects that they offer younger relatives (Hynes and Rommes, 2006). In Jill's case her family already seemed to be keen computer and Internet users and the emphasis for her was one of concern and supervision with regards to Internet use rather than a focus on life benefits for them. However the significance of intergenerational involvement is clearly part of her appropriation story.

Supporting Independence: A Means of Addressing Mobility Issues

The *committed adoptees* appreciated the potential of the Internet to support independence by addressing concerns over mobility both current and as part of an anticipated future. Here issues of self reliance in relation to meeting material needs were paramount,

I thought well we are a bit isolated here because we haven't got any family to help us around and no children or anything like that so we need to be very self sufficient and I'm Michael's sole carer and he can't really manage to go out or do anything...if I'm ill I need to be able to order my shopping and go on the internet and get it delivered (Sylvia)

In Baltes and Baltes' (1992) terms this would be considered selectivity with compensation as she is attempting to compensate for anticipated loss of function by alternative means in order to maintain her ongoing independence. Conversely there was a concern amongst the *reluctant adoptees* that increased dependence on computers and the Internet was not a healthy preoccupation, replacing important everyday opportunities for activity and social contact,

I don't want to be in that stream where you always have to put it on to see if you've got any messages (Jill)

For Jill engaging with computers and the Internet was seen as a goal that competed with her other social goals whilst for Sylvia they were seen as complementary. Clearly benefits are open to interpretation.

Emotional Reaction to Computers and the Internet

All adoptees expressed negative emotional reactions to using computers and the Internet particularly in relation to the process of initial learning. Early use was often accompanied by uncertainty and anxiety, verging on fear,

I mean it's very difficult, it is very intimidating, I mean what I found was that I wasn't afraid of it as such, what I would do is that I would put something wrong and I couldn't right it (Sylvia)

This is in line with other research highlighting the real problem of computer anxiety in older people's first encounters with computers (Ellis and Allaire, 1999; Charness and Czaja, 2005). Interviewees suggested that anxiety continued to overshadow computer use long after first encounters until their computer use could be transformed into some form of meaningful engagement. This was the case for the *committed adoptees* who had moved

on to greater appropriation but for the *reluctant adoptees* a strong element of anxiety remained, colouring ongoing computer use.

Too Much Emphasis on Information

Particular problems experienced when using computers and the Internet had stifled enthusiasm amongst the *reluctant adoptees*. One overriding factor which was also seen as an aspect of the modern world was that there was too much information to deal with. On a personal experiential level the amount of information was overwhelming.

I find that some of the information is overwhelming, there is just too much
(Kathy)

Another issue that interviewees had in relation to the over reliance on online information was that it was divorced from the source of knowledge, i.e. the person who knows that information.

The Social Effects of Computers

For all the adoptees (both reluctant and committed) the subtleties of face to face communication were seen as very important in establishing meaningful contact with others and computer-based forms of communication were seen as impoverished by comparison. The sense of another person's presence in conversation was important to maintain,

I say to other people if it's that important speak to me personally, I am on the phone, I have got an answer phone, speak to me personally and I find I need that person to person, and that person to person thing, to me is so important
(Bill)

Pre-existing telephone communication was seen as providing a much richer sense of the other person's presence which was needed for intimate conversations.

I have a grandson living in Australia and I still phone him. I don't use the internet and I know his internet number and we are both hotmail and I know we could both do it quite easily but I still like the sound of his voice because you can tell whether he is okay when you hear his voice (Kathy)

Here Kathy points out the importance of vocal intonation in establishing emotional intimacy. In particular text-based symbolic forms of Internet communication (e.g. email and discussion forums) were seen as problematic in not conveying these aspects in communication,

I find words on screen where people are sending you...they are different, they are not right and not adequate, you want to hear the emotion in people's voice and at least if they say a phrase or sentence and you want to query something, you can't send an email back and touch type the reply or whatever, it takes too long (Bill)

Evelyn is one of the reluctant adoptees. Whilst she was keen to express her dislike for computers she had made an interesting use of the website Friends Reunited which carried a strong emotional significance for her. Evelyn had grown up in a children's home in London but unfortunately she had lost contact with many of the people there that had been significant to her whilst she was growing up. When she retired she decided to find them by using the Internet. She decided to approach the administrators of the Friends Reunited website⁹ and asked them whether she could use their service as an online meeting point for the children's home. As a result over 40 people who had been at the home contacted her through the website. They now meet every year at a pub opposite the site of the original children's home.

These accounts highlight the importance of emotional intimacy rather than just the transfer of information as the fulfilling goal of communication amongst this group of older people. Computers and the Internet can provide meeting points for geographically distant others as a starting point for significant social contact. However available text-based forms of computer mediated communication (i.e. email) struggled to support ongoing intimacy by themselves as they were unable to convey the necessary emotional depth. Once again socioemotional selectivity theory (Carstensen, 1992) would suggest that such a demand for emotional depth is an important characteristic of ageing .

Committed Adoptees: A Personal Sense of Purpose

Three of the interviewees had appropriated computers and the Internet to a significant degree identifying their own sense of purpose for the technology beyond initial preconceptions. Here the relevance of these technologies has been firmly established and the positive benefits are being realised in the lives of these *committed adoptees*. There is also an enthusiasm with regards to learning more about the technological potential and a sense of personal investment in this process. Two of them (Jeffrey and Maureen) had adopted the technology after prior work experiences whilst the other (Sylvia) had no prior experience with computers at work. In all these cases the computer itself had attained a

⁹ www.friendsreunited.com

place of prominence within the living space and had become incorporated into the routines of daily living. The framing of computer and Internet use reflected idiosyncratic explorations of the technology's potential in relation to these individuals but the continuing influence of selectivity remains, defining which kinds of purpose are deemed to be relevant and beneficial. Two broad categories of purpose were evident and these were creativity and social contact.

Creativity

Two of the committed adoptees had discovered new technical opportunities which married with their particular creative interests and had developed increasing levels of engagement through these. Initial experiences of computer anxiety had been replaced in time with enthusiasm and enjoyment.

Maureen had been a music teacher all her working life. Ordering sheet music online was a revelation to her, giving her access to all sorts of sheet music that she had never been able to access prior to the Internet and allowing her to play new music,

I use www.Musicroom.com and it's amazing, it can come the next day
(Maureen)

Maureen had also become interested in digital photography on her computer buying her first digital camera 5 years earlier and emailing photos to her friends. She had recently bought a digital photo frame and was enthusiastic about being able to present her photos in this new way.

Sylvia had been using computers for about 5 years at the time of the interviews and her interest in photography had also blossomed as a result of her early discovery of digital photography.

I first got a scanner and then started scanning my film photographs out of the computer and I thought I saw these sites that has pictures that sell them and I thought I'm sure mine is good, as good as theirs is (Sylvia)

The commercial potential of her photography had quickly become obvious to her once online and this added another dimension to her creative endeavours. She tried to sell some of her photos via an online floral photography website but learnt that her old style photos taken with a normal camera would be rejected because the quality of the image was not good enough to be sold online. She decided to buy a digital camera and start working with that instead,

I got a Panasonic Lumix compact [digital] camera, and set about learning to use it (Sylvia)

Sylvia's use of her computer was initially framed by a passion for photography but also by a wish to create something of beauty for other people that had a definite message. As she explained,

I had seen photographs with text on, and I so wanted to do that, because I wanted to add Bible verses to pictures I was doing to make cards for some friends. I had been doing those for some years, using my old film pictures, which I had extra prints of and then typed out the verses and stuck the little paper slips on the cards to add the text. I wanted them to look professional, but could not discover how it was done, then I finally discovered that this little free program would actually do this, I was so excited!...I so wanted my photography to DO SOMETHING worthwhile and not just fill albums or discs which nobody would want. I kept looking on line to find the best ways to sell my work (Sylvia)

Sylvia eventually learned how to replicate the effects she had created by hand before using her digital image editing software.

Social Contact

The *committed adoptees* were well aware of the social aspects of computers and the Internet with them all using a number of different online communication media. Jeffrey was a regular user of email and Facebook keeping in touch with his younger London friends,

Well I've got all friends in their thirties and forties, I don't know why and they say we are having a party at such and such a nightclub in London so I go up and I join them and they welcome me and I sort of go to restaurants with them and things like that. They occasionally come down here and a benefit in that with Facebook because if you've got a group of friends scattered the other side of London and other places of course you know this sort of group that meet up every so often 'erm you all pile into Facebook and somebody says there is a party going on let's see if we can get a group to do it (Jeffrey)

Sylvia was also adept at using email and used it to keep in contact with friends and family in the UK. She had also 'adopted'¹⁰ some orphaned children some years earlier as part of her involvement with a church organization (six children in Nepal and another three in Ghana). Not having any children of her own meant that they had become very important to her. She had regular ongoing contact with them by email.

So I mean, they can email me, isn't that marvellous? there must be an internet cafe out there and they go and email me when it's nearly time for their next lot of money (laughs) so it's very important to me (Sylvia)

Sylvia had also discovered two particular websites Redbubble¹¹ and Zazzle¹² which had provided her with the means of turning her photography into saleable products the proceeds of which she sent to her adopted children abroad. These websites also gave her access to a creative community via their social networking facilities.

Oh it's very socially interactive. Now this is marvellous for lonely people because even if you're not a very great photographer you can soon learn and people will help you (Sylvia)

Sylvia was concerned however that the social involvement in these photography websites could be detrimental to her commercial productivity and by inference compete with her other social concerns,

Actually that's one of the downsides of RedBubble, there's too much social contact on it. You know for my liking because really now I'm very commercially minded. I'm just trying to make some money for my children (Sylvia)

Maureen also used email regularly but usually with friends and acquaintances rather than with family. When asked about using email with family she said,

I don't use it with my own children, we tend to talk on the phone or meet up, we just don't communicate like that...we're just used to communicating that way [face to face] (Maureen)

¹⁰ By this Sylvia meant that she financially supported them

¹¹ www.Redbubble.com

¹² www.Zazzle.com

She was also involved with the Expert Patients Programme¹³ who run self management courses for people with long term health conditions. Maureen joined this group through the NHS and had regular contact with other people in the programme via email and through their website. She also used Skype video conferencing for keeping in touch with her grandchildren in Australia, close friends in Spain and relatives in Birmingham and her husband's brother in Weymouth.

Emotional intimacy remains an important goal of communication for the *committed adoptees* and socioemotional selectivity is evident in the perceived primacy of face to face contact for Maureen and Jeffrey as well as Sylvia's dislike for shallow conversations on Redbubble. However the opportunities for computer mediated communication to support relationships are understood and explored to advantage. In particular the limitations of text-based communications for supporting emotional intimacy are addressed through the use of visual media. Maureen uses Skype video and photographic attachments to supplement email communication with family and friends, Jeffrey uses the multimedia elements of Facebook to stay in touch with friends and Sylvia relates to others using her digital photography. All these approaches add another dimension to communication which incorporates emotional elements.

Deep Engagement in an Online Social Context

It is clear that the *committed adoptees* are enthusiastic about using computers and the Internet and are in a continual process of learning new things about them. However one particular *committed adoptee*, Sylvia, stands out as being more *deeply engaged* than the others. Her computer and Internet skills are highly developed and daily online activities have become central to her way of life. She is a full time carer for her husband and it is not always easy for her to get out despite her own good health. Her deep engagement in digital photography gives her an outlet for self expression even when she is at home caring for her husband.

Fitting art work into my day is not easy. If Michael [her husband] is in bed, and I don't have to go out I work away. If he is up, I just fit it in where I can. Can be stressful, but as I get my stores stocked it will be easier (Sylvia)

Whilst ostensibly focusing on a personally creative endeavour Sylvia's initial use of computers and the Internet was embedded in a social relevance with an ongoing

¹³ www.expertpatients.co.uk

charitable motive in relation to her adopted children which gave her a strong personal sense of purpose in relation to her computer and Internet activities. Her wish to support them financially led her initially to explore the commercial potential of her photography online but also provided her with an incentive to learn more about digital creativity through her computer. She started to learn about digital image processing techniques on her computer using image editing programs like PhotoImpact, Paint Shop Pro, and ArcSoft Photo Studio. She managed to get a better quality digital camera through a Carer's Support Grant¹⁴ and a family friend installed a free trial version of PhotoImpact12 onto her computer. She started to teach herself how to use this software. As she explains,

I was rather slow at first trying to use it, because I needed to master the computer, but as time went by I tried it, at first it looked quite impossible to use, as there were few directions... I am hopeless at reading instructions anyway and never do unless I am stuckbut by trial and error I finally bit by bit discovered how to use it, I just kept working at it (Sylvia)

Whilst this learning was through specific digital image processing programs the literacy achieved had implications for wider use of computer applications.

I found that once I had mastered one program, it was not so hard to learn others, as I had an idea of how they worked (Sylvia)

Sylvia eventually learnt to use digital imaging software for a great number of photo editing tasks. She lists some of the most important tasks here:

Generic tasks for all photos - to lighten, darken or brighten, and increase or decrease the colour saturation, etc., also cropping unwanted parts from pictures;

Removing blemishes and unwanted objects by covering them with something else suitable. I find PhotoStudio 5 best for this;

Removing interesting images like flowers etc. from the background and storing them, so I can drag and drop them onto my work to make interesting pictures. The Thanksgiving range I have in my main Zazzle store is a good illustration of this, where fruit, pumpkins and autumn leaves have been added.

¹⁴ A local council grant intended to give carers a break from their caring role. See <http://www.eastsussex.gov.uk/socialcare/adults/carers/grant.htm>

PhotoImpact 12 had a special library where one can save these extracted items for future use, really useful;

Adding text. *I do this, a lot of this, and like PhotoImpact 12 best for this, I have never got round to learn how to do it in Paint Shop Pro;*

Adding frames to pictures...*I find that all three programs have good frames one can use, but the PaintShopPro is specially good at adding borders;*

Resizing images, which is important *as different Zazzle products need different size files to make them fit. PhotoStudio 5 I like best for this, very easy to do*

(Sylvia, by email)

Joining the Redbubble and Zazzle websites allowed Sylvia to turn her digital photography into saleable products such as mugs, aprons, mouse mats, greetings cards, t-shirt designs and calendars. At its simplest level these websites provided her with a place to present and sell her work, get feedback on it and to gauge the potential online market for her products. On another level they gave her access to a creative community which she could participate in despite her mobility constraints. Through this involvement she learnt a whole new set of literacies in relation to tailoring her photography to particular products. With the help of this existing creative community and the social networking facilities built into these websites, Sylvia started to learn the skills and techniques that were pertinent to doing this,

Many people start I think, but give up because they don't sell anything, but keep going and usually you'll get there, even if one does not sell anything, it is a lot of fun meeting other artists, and learning new skills does keep your brain in top condition!! I spend a lot of time working on art and doing my stores, also commenting on other people's work. One does learn from others, and seeing what they do, and I have one specially good friend I made on Zazzle and we share information. Learning basic html was a challenge, but now I can arrange my home pages as I like and that is a great help (Sylvia)

Whilst much of Sylvia's knowledge and expertise has been acquired through her own commitment to learning about specific applications her involvement in an ongoing creative community has given her opportunities for validating her skills and increasing

her awareness of design and the specific techniques needed to bring commercial success with her photography. Sylvia describes this process simply in terms of the following,

I mean you just have to find out what are customers wanting (Sylvia)

This simple and pragmatic statement belies the personal learning implicit in such creative endeavours which are ultimately judged in terms of their worth to others. This is simultaneously an exploration of self expression and relational value. Here are a couple of Sylvia's designs to illustrate this:

Floral wrap round mug design	A round design for key chains, stickers and magnets
	

Figure 3: Two examples of Sylvia's designs

Online digital photography has given Sylvia new opportunities for self expression that were not available to her before both in terms of her specific creative endeavours as well as through new roles emerging for her as a photographer, product designer, business woman and benefactor. Sylvia's deep engagement with the commercial aspects of online digital photography has provided her with an ever present sense of purpose which has also changed the experience of her offline world changing the way she sees the visual world and motivating her to seek out new photographic opportunities,

you know I think photography all the time. Whenever I'm out somewhere, even on the bus or something I'm looking out thinking 'oh wow, I'm passing a photograph' ...makes the world so much more interesting, and motivates me to be out and about... some while ago I took a shot of a painter up a ladder painting windows, and he must have had new white overalls on. Behind him was bright blue sky, and I have sold that shot time and again with Fotolia Stock Library (Sylvia, by email)

Sylvia described another occasion.

we stopped at the swing bridge there recently and I want a picture of ships going through the swing bridge, I've got a nice picture of it open but I haven't got a picture, I want a nice... it was a lovely sunny day, here comes the ship with its cargo. I was sitting on the bus watching it and I thought shall I say to the driver 'excuse me driver but I really need a photograph of this boat, do you mind if I just pop off and just take a photo' but I had two big bags with me and I thought no, if I get off I'm leaving my bags on the bus. I can't take my bags with me and I thought, well I just felt...it was silly because the bus couldn't leave before the bridge opened so I mean it wasn't going to go off with my bags on it but I just felt too uncomfortable about it...here is a card I did of Newhaven Swing Bridge, and at the top, in the middle is a shot of traffic held up at the bridge, which I took from the top of a bus! (Sylvia, by email)



Figure 4: A postcard design by Sylvia (the middle picture relates to the transcript)

Reflecting on Sylvia's appropriation from adoption through to deep engagement it seems that an activity which was initially relevant as a pragmatic way of supporting independent living through online shopping has developed into something which is personally meaningful with pragmatic, social, intergenerational and creative benefits.

Discussion

Establishing Relevance, Benefits and Personal Meaning

This study looked at how a group of older people established the relevance, benefits and personal meaning of computers and the Internet in their everyday lives in relation to their broader experience of ageing and independent living. Overall five broad framings of relevance were evident at adoption: 1) formal sharing of information, 2) aid to intergenerational understanding, 3) supporting independence, 4) social contact and 5) creativity. Whilst all interviewees were aware of these framings as being potentially relevant to them they did not necessarily see them as beneficial and worth exploring. Rejectors and reluctant adoptees were concerned that computers and the Internet would replace valuable opportunities for social contact and encourage an over-reliance on others that did not fit with their attitudes towards independent living. They defaulted to using computers and the Internet for the sole purpose of formal information sharing. Committed adoptees and the deeply engaged were less concerned about these issues and saw computers and the Internet as complementing independent living and social contact.

Notions of selectivity can be helpful in making sense of these different attitudes post adoption. Selectivity (Baltes and Baltes, 1990; Carstensen, 1992) implies that there is a selective narrowing of choices with increasing age. This means an optimisation of existing capacities and/or a compensation for losses. These capacities can relate to specific skill sets, cognitive abilities or availability of social resources. In this study reluctant adoptees' selectivity was driven by an existing skill set in relation to office use. The selectivity of committed adoptees included the whole range of themes identified.

The Different Phases of Appropriation

In this study four relationships were identified between older people and computers and the Internet: rejection; reluctant adoption; committed adoption and deeply engaged. These relate to three phases of appropriation over time (rejection - adoption - deep engagement). Both of these are shown diagrammatically in figure 5 below.

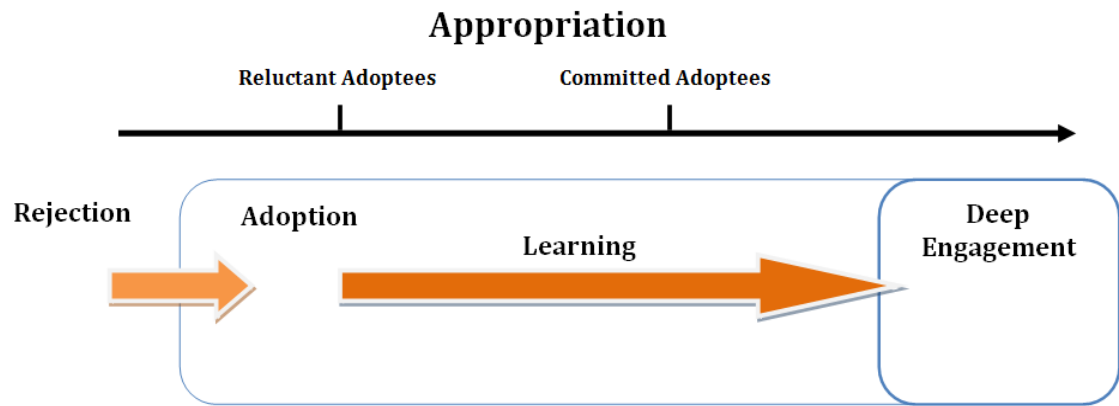


Figure 5: Appropriation Process Model from the Newhaven Study

Rejection

For the one *rejector* it is fair to say that computers and the Internet were deemed to be irrelevant to his life. Mortality and a sense of limited future time meant that for him learning about computers and the Internet was seen as a waste. There was a personal sense of wanting to spend his remaining time productively and this meant more social and spiritual motivations not seen to be in tune with such technologies. There was selectivity in terms of who to spend time with (Carstensen, 1999; Baltes, 1990) and of spending time on one's own in contemplation (Tornstam, 2005).

Reluctant Adoption

The five *reluctant adoptees* of computer technology had acquired their understandings of the purpose of computers and the Internet from prior work-based experiences which had identified them as functional tools. This has been a consistent finding in prior research involving older people young enough to have encountered them during their working life (e.g. Hilt, 2004; Ofcom, 2006; Lehtinen, Nasanen, and Sarvas, 2009). The use of word processing and formal email communications broadcast to large groups by them rather than as personal communication tools reflected a work-based and functional interpretation of relevance and purpose. These users had not been able to discover new purposes for the technology which might be personally meaningful to them as retirees. Their emotional reactions to computers and the Internet remained predominantly negative and not enjoyable with them choosing not to turn them on unless absolutely necessary.

Conflicting with further appropriation was an overriding social motive which strengthened the importance of managing social contacts and of encouraging intimacy with family and close friends. A greater significance was given to the emotional import of

sharing with others and computers and the Internet were not seen as supporting this. In particular the emphasis placed on symbolic forms of communication within the computer-mediated communication that had been used by the reluctant adoptees (i.e. text based forms of online communication: email, discussion forums, etc.) were not seen as enhancing *routes to intimacy* with their closest friends and family. Computer and Internet use was also seen by some as impacting negatively on relationships by encouraging a greater dependence on the technology and others.

Committed Adoption

The three *committed adoptees* had developed their own understandings beyond work settings allowing them to move beyond initial anxieties about computer use. Their enthusiasm for deeper engagement with computers and the Internet was related to them having been able to marry a personal sense of purpose with the new opportunities made available to them through the technology. Whilst new skills had to be learnt this endeavour was not seen as being unrelated to their own age-related concerns which were supported by the technology.

Similar social motives were apparent as with the reluctant adoptees except the technology was seen as supporting their potential *routes to intimacy*. The new opportunities for social contact and connection were recognised by this group and the inadequacies of text-based media were not seen to interfere with close contact. Online visual media-based forms of communication (Skype, Facebook, digital photography websites) were more common amongst this group as well as the ability to switch back to old media to maintain contact with significant others who were less computer literate.

Computer and Internet use was seen as supporting independence through providing opportunities for developing new roles in retirement through intergenerational connection, creativity and economic endeavour with a charitable goal.

Deep Engagement

There was only one amongst the Newhaven group who was deemed to have a *deep engagement* with computers and the Internet. In her case appropriation was accompanied by an active learning process embedded in the activities of an online creative and commercially minded community. Within this there were new opportunities for self expression and the establishment of new online roles. The development of an online presence in relation to Sylvia's creative and commercial endeavours influenced her experience of life beyond the computer, framing her everyday life in terms of photographic and philanthropic opportunities.

Summary

In this study the experience of computer and Internet appropriation has been considered as an aspect of older people's independent living using adaptive approaches to ageing to inform our understanding. Five key themes were identified which made computers and the Internet relevant to these older people: 1) formal sharing of information, 2) aid to intergenerational understanding, 3) supporting independence, 4) social contact and 5) creativity. These themes framed appropriation throughout but relevance in itself did not imply further appropriation with individual adaptations to age-related change emphasising some themes as benefits but others as deficits. Socioemotional selectivity (Carstensen, 1992) was shown to influence socially relevant use of computers and the Internet.

In terms of understanding appropriation as a process, three phases (rejection –adoption - deep engagement) have been established. More needs to be understood in relation to the learning that takes place after adoption which delineates reluctant adoptees from committed ones. This learning process appears to be central to explaining the transition towards further appropriation. This aspect of appropriation was not visible in this analysis but will be pursued in more detail in the next chapter.

Chapter 6 –The Age Concern IT Drop-in Centre

Covered in this chapter:

This chapter considers computer and Internet engagement as part of a learning experience in a community setting away from home where the context is clearly defined as being about learning to use computers and the Internet. It charts computer and Internet use by older people from initial encounters and beyond through a participant observation study undertaken at an IT Drop-in Centre specifically catering for older people in the city of Brighton in the South East of England. All those encountered at the Centre lived independently in their own homes and learning support was provided at the Centre by proficient volunteer helpers. The social context of use was shared with peers and social connections online were variable. This study focuses on the learning phase during and after adoption, exploring initial understandings of relevance and purpose as well as the way that actual use comes to influence ongoing appropriation decisions through encounters with technological opportunities and obstacles during use.

Introduction

For older people that do decide to engage with computers and the Internet, the decision to continue appropriation or reject such technologies is brought into sharp focus during their first encounter. This study takes a closer look at the practicalities of those first encounters exploring the negotiations that take place with the technology on a moment by moment basis, evolving over a period of time. First encounters are of course the point at which traditional accessibility studies identify obstacles to access. However viewing these encounters through the lens of appropriation allows us to examine the way in which individual orientations (to age-related change) impact upon a user's interpretations of what interacting with computers and the Internet is about. It also shows how actual use changes older people's understandings of the potential for these technologies and how this influences subsequent encounters. Rather than identifying obstacles to initial use as inherent flaws in the design of the technologies, appropriation asks how it is that users do make sense of their interactions with the technology in spite of age-related difficulties and

how the sense they make of them defines their future appropriation trajectory. Appropriation invites us to consider technologies as potential compensations brought into focus by users' underlying orientations to life and played out in a number of ways depending upon their existing knowledge, skills, temperament and their prevailing response to ageing.

The social context of older people's first encounters with computers and the Internet can be highly influential in directing their later appropriation of the technology. For those in the 'Newhaven' study their most common initial experiences were of them as work machines with correspondingly negative consequences for appropriation. This has also been found in other studies (e.g. Goodman et al., 2003). Conversely the right kind of introductory training context can influence older people's enthusiasm to learn prerequisite computer skills (Charness and Czaja, 2005). Older people generally take longer to learn these skills than their younger counterparts and the manner in which formal training takes place can be important.

Formal training which fosters an active hands-on approach rather than a purely conceptual understanding is likely to be more successful with older learners (Czaja, Hammond, Blascovich and Swede, 1989; Mead and Fisk, 1998). However the learning of basic procedures is insufficient to ensure appropriation. An important element of introductory use is the way in which the potential uses for computers and the Internet are presented (Charness and Czaja, 2005) and whilst the learning context can influence the learning of basic skills it also colours the sense that is made of computers and the Internet affecting ongoing appropriation. In a comparative domestication study, Hynes and Rommes (2006) showed how a focus on the teaching of computer skills alone could actually be detrimental to ongoing appropriation by creating 'informed rejecters' of some older users when they were unable to find personal meaning in the proposed use of the technology. Comparing two very different introductory IT courses, one in Ireland and one in Holland, they showed how ongoing domestication (and appropriation) was supported when support was given by 'warm experts' (Bakardjieva, 2001), i.e. where consideration was given to older people's personal interests and motivations and the particular meanings that they brought to their use of these technologies both initially and as an ongoing result of use. The following study employs a similar user-centred stance towards the introductory phase of older people's use of computers and the Internet and examines just what those meanings are at initial use and how they are transformed through use affecting appropriation.

Background/Setting

The participants of this study attended at an Age Concern IT Drop-in centre where they learnt about computers and the Internet. Age concern is a charitable organisation working in the UK for and with older people to promote their well-being (Age Concern, 2007). Their IT Drop-in centres are open to anyone over the age of 50 who wants to learn about computers and the Internet. In practice everyone encountered at the centre was of retirement age, i.e. over 65 for men and over 60 for women. The IT Drop-in centre used in this study was based at Age Concern's Brighton head quarters in the South of England. Users of the centre can 'drop-in' from 10am to 1pm from Monday to Thursday with Tuesdays being reserved for those studying for a formal computer proficiency qualification called CLAIT (Computer Literacy And Information Technology). New users will usually telephone the centre with questions before attending in person. There is one paid member of staff who provides technical support and oversees the volunteers working in the computer centre. There are 10 PC computers available for use within the centre, all running Windows XP, and one colour printer. They all have standard Microsoft office-based applications (word-processing, spreadsheets, etc), web browsing software and tutorials for mouse and keyboard work. They do not have speakers and the online video capability is only available on two of the machines. The computers run down the two opposite sides of the room with the screens facing away from the adjacent walls and the chairs facing towards the walls. Printing is free. The PCs are all networked together and connected to the Internet (see figure 6 below).



Figure 6: The Age Concern IT Drop-in Centre

The Induction Process

Tutoring support was provided by volunteers with minimal input from the paid member of staff. New users arriving at the centre were given a short induction session by one of these volunteers during which the attendee would fill out a form with their personal details so that they could get a username and password in order to gain access to the Age Concern network. The computers had two programs installed on them which were for complete novices to get to grips with the basics of using a mouse and keyboard. These may be used during the first couple of sessions for novice computer users if appropriate but users with some prior experience missed out this step of the induction. Beyond this point new users were expected to take the lead in terms of what they wanted to do. There was no expectation on the part of volunteers to introduce them to 'core' skills such as word processing or using spreadsheets unless they explicitly asked. The volunteers' role was to empower users in exploring aspects of computers and the Internet that they believed would be of interest to them and to explain unfamiliar concepts in relation to those uses along the way. This process usually started with a conversation between the volunteer and the novice user about their future expectations for computer use, their past experiences and their motivations for coming to the centre this time, i.e. in much the same user friendly manner described by Bakardjieva (2002) as 'warm experts'. These conversations would continue in an ad hoc manner throughout subsequent visits with volunteers suggesting alternative applications and resources when appropriate. Attendees would also share insights and suggestions amongst themselves. This made it the perfect setting for looking at users' appropriation of computers and the Internet directed by their own interpretations of use rather than those acquired through formal training of basic skills.

In order to learn more about the initial framings for older people engaging with computers and the Internet as well as the ongoing learning process, participant observations and contextual interviews were undertaken during weekly three hour sessions for a period of one year at the drop-in centre. The researcher acted as a volunteer helper in the centre, providing computer skills support to enable users to achieve their own self-determined aims. Computer users were informed about the research and where possible, engaged in discussion about their reasons for coming to learn about computers and the Internet. Over the course of the year 33 participants were observed with varying attendance patterns. A breakdown of their attendance characteristics is shown below in table 11.

Table 11: Characteristics of Attendees to Age Concern IT Drop-in Centre

Gender	Male	15
	Female	18
Age Group	60's	12
	70's	17
	80's	4
Period of Attendance	Once only	5
	once > 1 month	9
	1 month > 3 months	5
	3 months > 6 months	12
	6 months > 1 year	2
Previous experience with computers	Yes	9
	No	24

Findings

Reasons for Attending the Centre

Attendees cited a mixture of family and peer pressure, media influence (TV, national press, magazines and radio) and the need to secure independence through a greater use of technology as initial motivators for wanting to learn more about computers and the Internet by attending the Centre. Attendees admitted to an ignorance of new computer and Internet terms which had become increasingly frustrating in their everyday lives. Particular terms relating to computers and the Internet had become part of everyday language for younger people they came into contact with but remained a mystery to them. Terms mentioned were 'the Internet', 'World Wide Web', 'blogs', 'websites' and 'downloading'. Advice from younger relatives on the subject had been mixed with some receiving encouragement and direct assistance whilst others had been actively discouraged.

My daughter has no patience for me, she gets irritated when I can't remember what she's already told me (Eleonor)

and

My son decided that I was frail and elderly when I retired and wouldn't entertain my use of email when I first got a computer, he dismissed my attempts as foolish (Dorothy)

Negative comments seemed to have galvanized some of the attendees into learning more by attending the Centre. Their general lack of knowledge made the first encounter an anxious affair with attendees reticent to touch the computers at all until they had

unfamiliar terms explained to them. For some the *purpose* of computers and the Internet was still not clear even once they had started to use the keyboard and mouse.

I want to get going on something but I don't know what's available (Ken)

and

I'm trying to work out what the point of this [computers] is. It's like being in a shop but there not being anything that you want to buy (Patrick)

As with the 'Newhaven' study previous direct knowledge and experiences with computers were predominantly with them as work machines, defining a certain expectation of purpose. Some of the men encountered also differentiated them as office-based work machines,

they [computers] are office technology not engineering tools (Doug)

Those with young grandchildren were also aware of computers as games machines,

The kids play on the games but I'm not interested in any of that (Felicity)

The sense of purpose for particular attendees only began to elaborate itself more fully once they were able to marry some of their own interests with the potential offered by computer and Internet use. It was only at this point that the relevance of computers and the Internet became more than just a distant conceptual understanding and their potential for being personally beneficial and supporting individual experiences (of ageing) started to be realised. An inability to construct an overarching purpose at this stage could also cause users to reject the technology wholesale. One attendee's frustration with computer terminology became overwhelming on her first and only visit to the Centre.

It's like being in another country like Germany or somewhere and not knowing what's going on. It's another language! (Glynis)

Beyond the difficulties of understanding onscreen instructions, it transpired that Glynis was not clear why she was at the Centre. Worse than that, suggestions made to her by those present about the possibility of making social contact with significant others via the Internet (e.g. through email) she found very disturbing, acting as a reminder for her of all the people that she would have made contact with in the past and forcing her to revisit this sense of loss of old friends and relatives who had died. Glynis also added that the reason she had come to the centre to learn about computers was so that she would have the opportunity for some direct social contact. Engaging with the computers seemed to obscure that aim. As with others in the Newhaven study the importance of emotional

intimacy and socioemotional selectivity (Carstensen, 1992) was evident in determining Glynis's engagement and frustration. In the middle of her session at the Centre she decided to leave and did not return. Glynis was the only person to give up learning about computers at the Centre throughout the whole year of the study.

Attendees typically developed some kind of purpose for using the computers in the first session if they had not started with one already. Further analysis of the attendees responses at initial use identified the following six broad categories as providing an overriding sense of purpose for them (these broad categories of purpose were not mutually exclusive) :

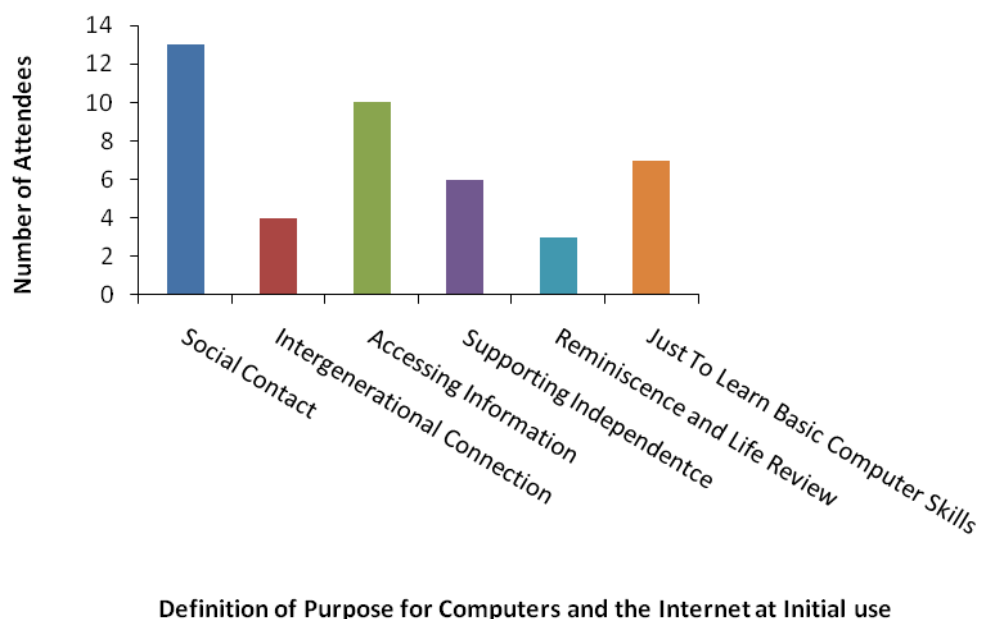


Figure 7: Definitions of purpose by Age Concern attendees at initial use

As shown in figure 7 above social motivations were the biggest influence on initial use. Including both social contact and intergenerational connection as social categories, just over half of the attendees (17/33) were motivated in this way. More personal uses were also evident with computers and the Internet being used to access online information as a source of learning (10/33), as a means of supporting their independence (6/33) and as vehicles for reminiscence and life review (3/33). Basic skills learning as a motivation in its own right only accounted for 7 out of the 33 attendees. The following vignettes show the specifics of how attendees' defined their sense of purpose when they first started to use the computers.

Social Contact

Email was seen as a cheap way of maintaining contact with distant family and friends and the majority of attendees were keen to explore this opportunity in addition to their current forms of contact which were letters and telephone calls. Within the context of the drop-in centre web-based email services were used such as Hotmail, Yahoo or Gmail.

Ruth's son had moved to China after graduating from university and she wanted to maintain contact with him via email as she feared there would not be good telephone access there. Ruth was a complete novice but she wanted to learn all the steps necessary to make this possible. This would help her to maintain an important family tie, easing the sense of distance she was anticipating between herself and her son. (web-based email)

Accessing Information and Learning

The ability to access the wealth of information available through the Internet without having to go anywhere (as might be the case with library resources) or to buy anything (such as a book) was recognized as an important resource by attendees. Information seeking was most often started with an end goal in sight, i.e. with a website in mind or by reference to a web address written on a piece of paper and brought into the centre. Open-ended searches where the destination was unknown at the start were rare. Accessing web-based information was demonstrated through Internet search engines rather than typing web addresses in directly. Those who had already set up web-based email accounts liked to use the accompanying search engine, e.g. Yahoo search for those with Yahoo email accounts. Otherwise Google search would be chosen by demonstrators as a recognized source.

Ivy wanted to look up the Planning Department of her local council online to find out details of a development of flats that was due to take place behind her home and also to find ways that she could challenge this development (local government website)

Carole had always had trouble with vine weevils in her house plants. She wanted to find out if there were any remedies for this via the Web. (Google web search)

Phil had developed a kidney complaint and wanted know if there were any holidays that catered for dialysis. He found one particular website (<http://www.freedom-apartments.com/>) with holidays throughout Europe. (Google web search)

Information was commonly sought as a consequence of conversations with peers or prompted by interactions with other media particularly newspapers, radio and television. Ivy and Phil had been told by friends during a conversation that the information that they needed could be found online. Carole had been listening to a gardening program on the radio and thought of a question that she would like answered. Her visit to the drop-in centre gave her an opportunity to find an answer herself.

Supporting Independence

Internet access can provide access to material resources without the need to travel great distances and this was seen as an important aspect of maintaining independence. This was explored in a number of ways through online shopping, employment opportunities and online selling. Online shopping was entertained by a few but there was great distrust about online payment methods which deterred many of the attendees. No one encountered actually got to the point of buying anything whilst at the centre but a few such as Barbara made this their ultimate aim and experimented with supermarket websites whilst at the centre.

Barbara was finding it increasingly difficult to get to the shops as a result of multiple physical ailments including diabetes, a kidney complaint and general aches and pains. She wanted to be able to get her grocery shopping delivered to her by doing her shopping online. (supermarket websites)

Opportunities for employment were appreciated and were explored through the use of online employment agencies.

Doug had been an electrician all his working life and was struggling to maintain his standard of living on his state pension. He wanted to find work online. (employment agency websites)

Heleen had recently arrived in England from Holland and wanted to find work as a nanny to finance her stay here. (local council website for childcare opportunities)

The Internet was also seen as a good place to sell goods to make some extra money. The online auction website eBay was greeted with particular enthusiasm.

Frank and Mary had inherited some antiques and bric a brac. They wanted to sell these on eBay to supplement their pensions. (eBay)

Frank and Mary had been told about the website by some friends and came to the centre to find out more about it.

Intergenerational Connection

Computers and the Internet were seen as an important ingredient in relating to younger generations. This was viewed in terms of accessing the same channels of communication that predominated amongst the younger generation and engaging in the same practices as they may do. In this case this was done by Dorothy 'appropriating' email as a means of telling stories to her neighbour's children. She added another dimension to this storytelling, that of maintaining a permanent record of her stories by typing them into a word processing package first.

Dorothy was writing a children's story for her neighbour's children explaining that she was a "frustrated grandmother", not having any grandchildren of her own. At the Centre she wanted to transcribe her handwritten notes into a word processing program and send these by email as an attachment to her neighbours. This activity helped her to feel part of her local community, to engage with the younger generation and to embark on a creative endeavour.
(word processing and web-based email)

Reminiscence and Life Review

Computers and the Internet were seen as providing opportunities for reflecting on the past. Virtually visiting other places and times via the Internet without leaving one's seat was one way in which this was achieved.

Friderich emigrated to England from Hungary many years ago. He wanted to see what information and photos from his country were available on the Web. He spent a long time just looking at the photographs (Google web search and Hungarian websites)

The ability to record a more permanent record of one's life and to reflect upon this whilst typing it into a word processing package was another way of revisiting the past. For some meaningful props were used as starting points.

Mary decided to learn about word processing by typing out all the handwritten recipes that she had collected throughout her life. Through this process she revisited past times as well as learnt new skills. (word processing)

Others were driven by a sense of obligation to younger generations.

Ben's son convinced him to buy a laptop so that he could write his life story on it. He came into the Centre to learn how to use the word processing program so that he could pass on his memories. This provided Ben with an opportunity to pass something on to the next generation by way of his story and to feel part of his son's world by engaging with this new technology. (word processing)

Here again we also see the importance of intergenerational connections in framing meaningful use around reminiscence and life review.

Learning of Basic Computer Skills

From these vignettes it is clear that learning how to use computers and the Internet was rarely divorced from meaningful activity in terms of that person's life. Indeed as Glynis's earlier example shows difficulties in establishing a meaningful sense of purpose at the start can undermine the whole learning process. Acquisition of specific skills was most often embedded in an overarching sense of purpose which gave structure and ongoing motivation to learning of basic computer skills. It could still be an aim in itself but this was for a minority of attendees with most skills learning subordinate to another sense of purpose. Those attempting to learn these skills alone were often frustrated by a lack of meaning in their activities:

I've learnt all about Word since I've been coming here but I don't give a stuff about using it (Duncan)

Reflections on Learning Support

An important point to comment on here is the role of the volunteer support in providing alternative framings for attendees' computer use. This was done by asking questions early on (during the first two or three visits) about individual interests that they had offline or asking attendees about areas that they were curious to find out more about. Sometimes this would be just words they had heard on the radio and wanted to understand or it may have been specific things that they wanted to be able to do online. The task of the volunteer was then to offer suggestions about how these interests could be explored by using computers and the Internet or ways of explaining concepts by demonstrating examples on the computer. This meant identifying what applications had to be used and what basic procedures had to be followed.

Obstacles to Greater Appropriation

Learning the necessary technical literacy to achieve these intended aims was complicated by some of the 'deficits' of ageing presenting themselves as obstacles during initial use.

However what also became clear was that a well-defined sense of purpose could be helpful in reframing these obstacles into challenges. Users were resourceful in establishing their own workarounds keeping their ultimate goal in mind. This appreciation of adaptive approaches to age-related decline fits well with Baltes and Baltes' (1990) notions of selectivity with optimisation and compensation. There are a number of well established physical and psychological deficits relating to visual acuity, reaction times and memory capacity which all presented themselves as obstacles for the attendees and were overcome to varying degrees by adapting their own behaviour.

Visual Acuity and Bifocals

The majority of attendees had trouble viewing onscreen text. Whilst they were shown ways of increasing text sizes according to different applications, they found this too hard to remember. Those with sight problems also wore glasses for reading and many of these wore bifocals. These are designed for reading text close up but usually below eye level and at table height which does not work when text is being displayed on a computer screen at a very different height and reading angle. Typically attendees have to incline their head backwards to view the screen through the reading portion of their bifocals, forcing a quite uncomfortable posture (see figure 8 below). One regular attendee (Eleonor) had started to promote her own solution amongst other attendees which was to turn her bifocals upside down.



Figure 8: Illustration of older person using bifocals to read on screen text.

Reaction Times and Practice

The majority of women attendees were already familiar with QWERTY keyboards for entering text thanks to prior secretarial work or training with typewriters or word processors. All the men lacked this familiarity and resorted to the one finger style of typing taking a long time to type. Another mouse-related issue was that of the 'double-click'. Operating programs within the environment of a standard Windows operating system normally requires a 'double-click' to activate a program from an on-screen shortcut. For

many of the older people attending the centre, the rapidity of execution needed for two subsequent clicks was too quick, requiring a physical dexterity that they found difficult even when shown.

The problems associated with older people's physical dexterity and computer use are of course well documented (e.g. Smith, Sharit and Czaja, 1999; Czaja and Lee, 2003; Keates and Trewin, 2005). What is interesting to note in this instance is that whilst the physical difficulties encountered during initial use were frustrating they were insufficient reason for rejecting the technology. Across the board there was a temporary reorientation of purpose by users. It was acknowledged that new physical skills had to be learnt and *repetitive practice* was enacted as a temporary form of engagement with the technology. This meant using the pre-installed practice mouse and keyboard exercises provided with the Centre's computers or choosing a *meaningless* activity, i.e. one not related to their original overarching purpose, such as a painting program, word processing program or simple game such as Solitaire which involved repeated enactment of the required skills. For two of the attendees encountered, developing competence through practice became a purpose all of its own with them continuing in this vein on subsequent visits. For the majority however (the remaining 31) this was viewed as a temporary distraction and even with minimal competence they were eager to move on to something 'real'.

Memory, Practice and Notebooks

Attendees found it very difficult to remember things about using the computers from one week to the next. The relevance and importance of usernames and passwords were rarely understood by new users and were usually forgotten by the time they returned for subsequent sessions. Similar problems arose in relation to web-based email accounts that might have been set up during sessions and later forgotten. Memory capacity could also be an issue during use. For instance, the number of steps involved in accessing and using simple computer applications was often too much to remember when first encountered. As one attendee pointed out after attending the centre for a number of weeks,

I can't remember how to do things (Ivy)

Once online with a web browser the expectations for comprehending and assessing information are multiplied in a way which is also overwhelming. Commenting on the amount of information available when using the Web,

too much information (Duncan)

and

too much text on the screen (Ivy)

The fact that online information can be scrolled through adds yet another burden to memory resources for those with memory problems and they would avoid scrolling down web pages if they could. This was particularly a problem when using web-based email where interruptions to the flow of responding to an email were inevitable given the need to scroll. This hindered conversational integrity with users forgetting what it was that they were responding to.

The association of memory problems with older people's engagement with computers is also well documented (Meyer, Sit, Spaulding, Mead and Walker, 1997; Meyer, Mead, Rogers, Schneider-Hufschmidt, 1998; Sharit, Hernández, Czaja, and Pirolli, 2008). However, the way in which older people deal with these problems is also interesting. At the Centre attendees would rely on residual memory from repeated use as much as was possible, sometimes deliberately repeating actions with a view to remembering them better. Often the expectation of remembering from practice did not match up with the reality and other tactics had to be used. Some attendees such as Ivy would use 'social memory' to overcome this problem, either by expecting volunteer helpers to remember things for her or to reset passwords she had forgotten. In time all newcomers to the centre would also start to make notes so that they could remember important details from visit to visit. Some would start with small pieces of paper but all would eventually gravitate to using larger notebooks in order to record the sequences of actions and other details relating to use (see figure 8 below). Notebooks became an important memory aid bridging between the relative permanence of written words and the insubstantial 'memoryless' state of computers and the Internet.

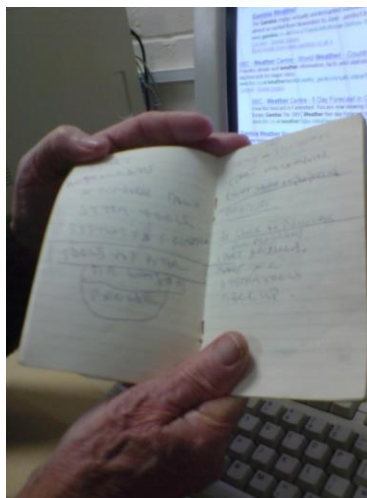


Figure 9: Notebook used in the Age Concern IT Drop-in Centre

Making Sense of Computers and the Internet

Older people come to computer and Internet use with their own ways of understanding how to use them at times informed by prior experiences with similar technology but for the most part they must start exploring their use without an adequate understanding. In this section the way in which users deal with this lack of familiarity is considered and how they integrate these aspects of use into their existing understandings.

A Different Form of Literacy

Computer and Internet use requires a new understanding of the role of language in this context. Initially this reorientation towards language is a major endeavour. As one attendee pointed out,

it's another language! (Glynis)

New Words

Computers use different terminology and the messages presented to attendees by the computers were often difficult to understand at first. This was particularly the case with error messages. For instance whilst attempting to view a location in Google Earth, Duncan received the following error message:

Your screen resolution is currently too low. Please adjust it to 1024x768 or above and then restart Google Earth. To adjust your screen resolution, right-click your desktop and select "Properties." Then, go to the "Settings" tab and drag the slider to the right before selecting "OK."

There were a number of computer-specific terms contained within this message which Duncan could not interpret including 'resolution', 'right-click your desktop', 'tab' and 'drag the slider'. He turned to the volunteer helper for an explanation. Other computer specific technical terms are common place when interacting with computers particularly within error messages. Problematic words were encountered particularly whilst using web-based email with confusion over words such as 'username' (Carole), 'Mail server' (Ivy and Betty) and the distinction between 'send' and 'sent' when accessing email messages (Carole).

Different Implications to Human Use of Words

Beyond the linguistic meaning of particular technical terms, computer systems also add functional elements to their use which are not easily understood by older users initially. Words are often more than inert symbols on the screen having an additional 'active' potential. For instance words presented as hypertext introduce the opportunity of following links to other web pages by clicking on them with the mouse. Likewise onscreen

buttons with words will usually activate particular functions when clicked on. These literacies are implicit in the functionality of computers and the World Wide Web but unknown to naive older users. They are also impossible to decipher by simply reading them from the screen – ‘active’ exploration is necessary in order to learn.

Different Implications to Computer Use of Words

The expectation with computers and the Internet is often that words will be typed onto the screen by the user and then entered into a particular computer system to be interpreted. This could be when using a search engine, online map search or indeed searching any website for content. The implications of this distinction, i.e. ‘computer interpreted’ versus ‘human interpreted’ were often not appreciated by naïve users and were initially difficult to grasp. For example, one user, Christine, experimented with using the Google search engine by typing in the clues from her newspaper crossword verbatim (see figure 10 below).

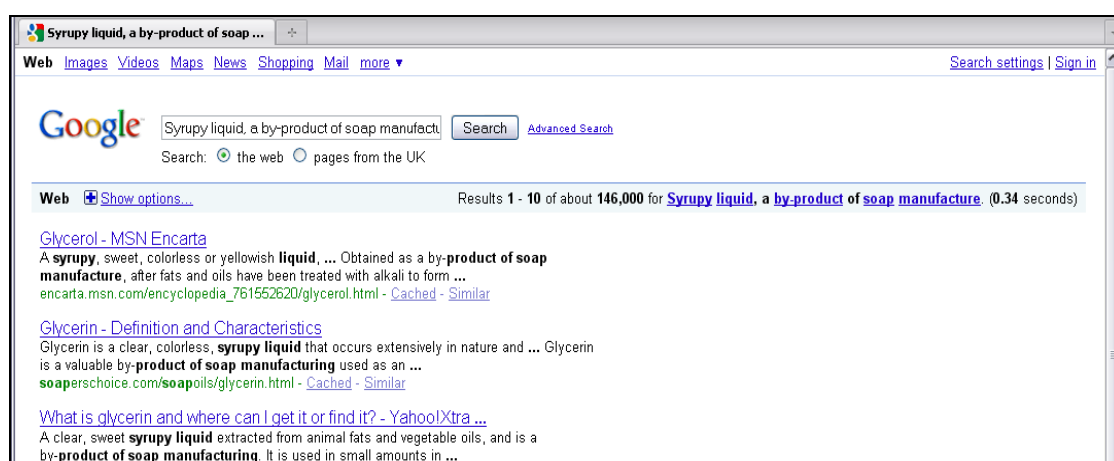


Figure 10: Example of ‘crossword clue’ web searching at Age Concern IT Drop-in Centre

A Web search engine is not strictly set up for natural language searches like this although it can return definitions that are helpful with a crossword (depending on the way in which the clue is phrased). Whilst Christine is using the ‘wrong’ mental model (and is cheating of course) this technique provides her with a structure for serendipitously exploring the Web, learning new skills in relation to understanding search results, navigating the Web and increasing her general knowledge. In time one would expect that her awareness of the implications of her word use would develop but at initial use this is not driven by a prior understanding of how computers interpret language.

The Connected World of the Internet

The interconnected nature of the Internet was apparent to most of the newcomers but often the constructs that they employed in order to understand them came from ideas

based on physical connections rather than the symbolic addressable connections that make up the Internet.

I know that the computers are on a little circuit but is that the Internet? (Kitty)

Another older user (Patrick) who had been a telephone engineer during his working life and related the addressable network of the Internet to a more familiar telephone system where website URLs were like telephone numbers with blocks of address for the system (<http://www>), the country (.co.uk) and the location (e.g. brighton).

Although an aid to understanding, such rudimentary mental models do not capture the reciprocity of the Internet and the corresponding need for security measures on such a network. The need to log into such a network initially appeared alien and unnecessary to many attendees. Correspondingly the importance of usernames and a passwords and the distinction between them was often not apparent and they were often entered as if they were interchangeable. For many newcomers the need to have a password at all seemed absurd. As one irritated attendee stated as he was in the process of setting up a new email account,

Why do I need a password? This isn't the war! (Ron)

Usernames and passwords were consistently forgotten not necessarily because they could not be remembered (or written down) but because their significance was not appreciated.

The Virtual World of Computers and the Internet

Computers and the Internet also introduce a new dynamic to symbolic communication which foregrounds onscreen manipulation as the control mechanism e.g. the coordination of pointers on the screen via mouse movements and actions (i.e. virtual control). For example the manipulation of web pages by using a mouse in conjunction with clickable areas on the screen or the possibility of exploring online content by scrolling or using pull down menus.

The naïve older users initially experienced problems with virtual control but these tended to be as a result of poor physical dexterity rather than through an inability to understand the underlying concepts. Whilst there was no hesitation with moving the mouse about and realising its onscreen effects, mapping one to the other was difficult for all newcomers. Again active exploration was necessary for learning to occur.

The psychological leap of virtual control also reframes the object of control (i.e. the display screen) as something malleable and never fixed. This was particularly difficult to grasp for

those with extensive prior typing experience. After typing out a document using a word processing program one lady (who used a typewriter every day of her life) asked,

so how do I get the paper out of there [pointing at the screen] (Doreen)

The concept of virtuality is multiplied when a computer is connected to the Internet with the possibility of interacting with remote computers via the one screen. As a result the virtual 'location' of web-based email accounts was often confusing to newcomers. For instance some attendees (Ivy, Muhammad and Ruth) would initially go to the website relating to the recipient's email provider rather than their own when they wanted to send them an email. Upon realizing that they could not log into this website they would return to their own email provider's website, essentially following a trial and error learning process.

These examples show that an adequate understanding is not possible when older people start to use computers and the Internet but comes about after engaging in an active, trial and error exploration of the functionality.

Continuing Appropriation

Beyond initial use the sense of purpose continued to evolve as new skills were learnt and the possible benefits of computer use were unearthed. With time there was a clearer definition of computer and Internet use as something that was personally meaningful and a gradual shift from reluctant adoptees to committed ones. Social contact remained an important element for all those encountered at the drop-in centre with attendance at the centre becoming a social event of its own particularly for regular attendees. For the majority of those observed, however, establishing or maintaining social contact with distant family members and friends remained a strong motivating factor for using the computers, primarily through the use of web-based email such as Yahoo and Hotmail. Whilst setting up, accessing and learning how to use these personal email accounts would take some time attendees would spend the majority of their time at the Centre writing content for their personal emails, thinking long and hard about what they wanted to write. Regular attendance at the Centre for long periods was uncommon (see table 11) but two attendees who did attend regularly for the whole period of the study (i.e. one whole year) were interviewed to see how their appropriation of computers and the Internet had developed during that time. Vignettes outlining their development over this time follow:

Ivy – she started by accessing planning information online and setting up a web-based email account for herself. After a couple of weeks she decided to join the local Freecycle email list¹⁵ which allows people in a local area to share unwanted household items via the Internet. She was soon inundated with emails for free items. She found this incredibly frustrating as although she wanted to be included in this group she felt overwhelmed by the number of emails and the amount of information she had to deal with. She cancelled her membership a couple of weeks later. Ivy had a middle-aged son with autism who was being cared for by social services. She was very involved in his care and recruited a new carer for her son via a web-based recruitment agency. Later on in the year she joined a number of online forums some focussing on local community issues CUPP (community university partnership project) and others relating to her son's care such as APANA (Autistic People Against Neuroleptic Abuse), a group lobbying for changes in practice relating to misuse of medication given to autistic people. Ivy believed that this had been the case with her son some years earlier and had heard of the group from meetings of similar concerned parents. Towards the end of the year Ivy had a stroke at home and ended up in hospital for some weeks. When she returned home her son had been moved to a group home without her consent. Ivy came into the centre at this point to find out her legal rights as a mother and to access advocacy services online. Talking to her at the end of the year she was pleased about how the Internet had "kept her informed" but did not enjoy using computers. Her stroke had made cognitive tasks more difficult but she said that she had never found interacting with the computers easy. She had struggled from the beginning to remember the usernames and passwords for the computers, email accounts and online groups and still could not remember them. Rather than write these things down as others had learnt to do she chose to rely on the volunteer helpers at the Centre to remember the details for her or to reset them where necessary.

Ivy's appropriation of computers at the centre was initially prompted by a desire to access information online and to establish quite formal social contact with others via email in much the same way as the reluctant adoptees in the Newhaven study. This framing remained part of her ongoing attendance and she clearly recognized the value of computers and the Internet in this respect even though she struggled with the cognitive aspects of using them. Over time the Internet and the drop-in centre became an important informational resource for her to draw upon and empowered her to become more involved in her local community and to exercise her legal rights. The intergenerational connection with her son also formed an important backdrop to her ongoing appropriation, giving meaning to the social contacts that she established via email and the groups she

¹⁵ The FreeCycle Network (<http://www.uk.freecycle.org/>)

joined on the Internet. Whilst she was clearly reluctant to interact with the computers she was strongly committed to helping her son in any way that she could and this pushed her to further appropriation. With Ivy's failing health it became even more important for her to feel that he was being properly cared for and would continue to be when she was no longer around. The Internet gave her access to alternative views on his care from other parents and professionals which helped in this regard. The drop-in centre provided Ivy with a way of compensating for her very poor memory and it is unlikely that she would have been able to carry on using computers without this assistance. Her learning process did not result in her independent use of computers and the Internet but rather a redefinition of the social dynamics within the drop-in centre so that interdependence became an acceptable basis for ongoing appropriation. This meant that Ivy's use of the computers was intimately connected with the context and the relationships that she had built up with the volunteers over time. Incidentally she had bought her own laptop for use at home but never managed to do this as she was completely reliant on help from the volunteers to make any progress.

Ruth – her initial motives were to keep in touch with her son who was moving to China to teach English. She initially attended the centre with a friend, Carole, as they did not feel confident enough to go on their own. They were both very anxious about using the computers but both started by setting up their own web-based email accounts and looking for information on the Web. They would often arrive at the centre with web addresses that they had copied from magazines or from the television. The value of email communication struck Ruth when she received an email from her son in China with photographic attachments so that she could see where he lived and the places he had visited. She responded to this moment with delight and renewed enthusiasm about the wonders of computers and the Internet. In talking to Ruth after about 6 months of attending the centre she said that she had become more confident as a person as a result of learning how to use computers and felt easier talking to people in public because of it. She had also learnt a great deal about China via the Internet which made her feel much easier about her son being there. By the end of the year things had changed again for Ruth. Carole had been taken ill with cancer and had died. Ruth herself had decided to stop using the computers regularly at the Centre and only rarely came in to email her son. It transpired that she was now using a cheap international phone card to talk to her son in China making the telephone her main route for communicating with him. She said that this was because she felt closer to him when she could hear his voice and that Internet cafes in China were full of cigarette smoke which made it unpleasant for her son to use them.

Social contact and intergenerational connection were the initial incentives for Ruth to come to the centre and learn about email. As with many others at Age Concern and in the Newhaven study this was to maintain intimate family contact over long distances. Learning how to use computers and the Internet had a positive effect on her overall confidence changing her sense of self and the way that she related to others. Ultimately email did not provide her with a sufficient degree of emotional intimacy between herself and her son. As with Bill and Kathy in the Newhaven study the ability to hear another's voice through telephone contact was felt to carry important emotional depth that was not possible through text-based email.

Through these two extended accounts of appropriation the impact of significant life changes common to advanced age is evident as well as the ways that computers and the Internet are drawn upon to adapt to these changes. Ivy suffered personal illness and an ongoing decline in her own cognitive capacities. Ruth experienced the loss of a close friend and the growing independence of her son. Both had strong feelings of responsibility towards the next generation which motivated them to use computers and the Internet to a greater extent and then (for Ruth) to abandon them in favour of the telephone. Clearly the relevance and benefits of technologies are constantly being reassessed in lieu of broader life changes showing the contextual and 'unfinished' nature of appropriation. Ivy's example also shows in a very stark manner the way that older people's functional capacity starts to depend more and more on the receptivity of other people around them and the increasing importance of social contact as a consequence. This is an underlying theme to many of those encountered at Age Concern.

Discussion

Establishing Relevance, Benefits and Personal Meaning

Overall computers and the Internet were seen to be relevant in similar ways to in the Newhaven study, i.e. social contact; intergenerational connections; supporting independence; accessing information. Creativity was not seen as a relevant use in this context but an additional one of life review/reminiscence was. The identification of particular relevant purposes for computers and the Internet showed adaptation to ageing in terms of a selective narrowing of possibilities as described by selectivity (Baltes and Baltes, 1990). This coalesces around specific choices in terms of applications and subsequent learning. Learning post-adoption sought to optimise and compensate for existing resources and to realise physical, psychological or social benefits. This learning in

turn brought new understandings of relevance and potential benefits. Socioemotional selectivity (Carstensen, 1992) was also influential in transforming initial assessments of relevance into personally meaningful engagement as it had been in the Newhaven study. The importance of social contact and emotional intimacy guided choice in terms of communication media and degree of appropriation.

The context played its part in defining engagement, providing opportunities to explore alternative notions of relevance with the help of volunteers and peers. It also directed learning through a scaffolding approach towards independent use of computers and the Internet with some exceptions (e.g. Ivy) who became reliant on the social context for ongoing use.

The Different Phases of Appropriation

This study reinforced and elaborated on the phases outlined in the Newhaven study but redefined learning more specifically as ‘active’ learning.:

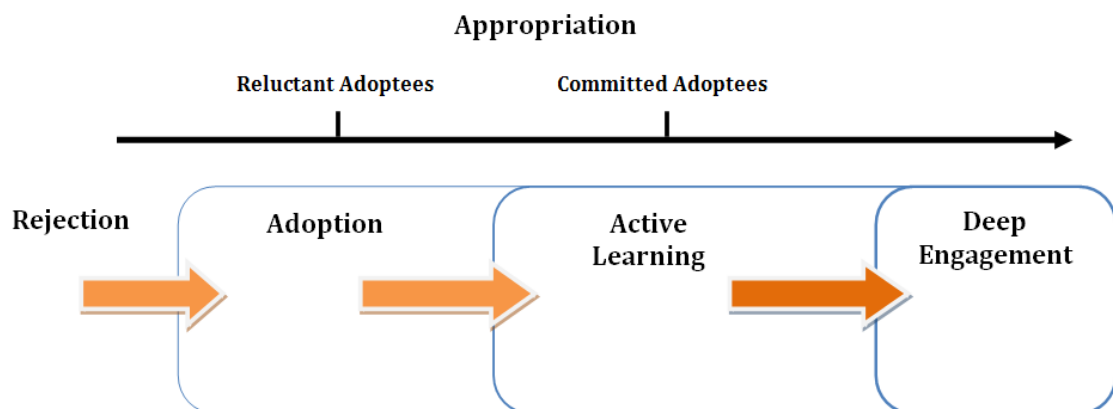


Figure 11: Appropriation Process Model from the Age Concern IT Drop-in Centre Study

Rejection

There was only one example of the rejection of computers and the Internet. In this instance difficulties in learning the prerequisite computer literacies were accompanied by a strong sense of alienation rather than the anticipated possibility of immediate social contact suggested by learning at the centre. This highlights a mismatch between concerns with respect to ageing and the opportunities afforded by the technology.

Adoption

The adoption decision was based on users actively trying out their existing abilities, knowledge, relationships and inclinations in relation to the apparent functional capabilities of this new technology, assessing its relevance and potential benefit within their lives. Prior to actual use, the initial sense of purpose defined by this group of older people was predominantly of computers as work machines and for a small minority as children's games machines.

Social Context of Initial Use

Volunteers at the Centre helped to provide alternative frames of reference for those attending. Previous definitions were rapidly transformed at initial use with older users being opportunistic in establishing new aims that were relevant to them and not about work. In order of significance for this group these were 1) to support social contact, 2) to access information and learn, 3) to simply learn basic computer skills, 4) to establish intergenerational connections, 5) to support independence and 6) to engage in life review and reminiscence. Excluding the simple learning of basic computer skills (which is an ongoing aspect of using the computers whatever the purpose) it can be seen that the different categories of purpose carry through into appropriation reframing use.

Active Learning

It seems that whilst learning the functional expectations of the technology were important for these newcomers it only made sense once wrapped up within this pre-existent process of personal meaning-making in their lives, i.e. the learning of basic computer skills was most commonly embedded within a broader sense of purpose which related to ageing concerns. If these categories are related back to the Newhaven study, three of them were also present there amongst the adoptees (social contact, intergenerational connections and supporting independence) with accessing information and life review/reminiscence providing a new sense of purpose for some at Age Concern.

Having settled on a broad sense of purpose in line with these five different categories attendees began pursuing them through particular choices in terms of using relevant applications and making choices within the context of that use. These choices can also be seen to reflect an underlying stance influenced by ageing concerns and these are explained here.

Social Contact

Computers and the Internet were used primarily for making contact with geographically distant family and friends. This was done almost exclusively through the use of email as has been found in previous studies (Goodman et al., 2003; Dickinson et al., 2005; Fox, 2004; ONS, 2009). However it is worth taking some time to consider the reasons for the importance of email in relation to some of the socio-demographic changes that have accompanied the process of industrialisation in developed societies. For instance the notion of 'family' as a source of stability is constantly being challenged within such societies. Families rarely remain in a particular locality from generation to generation. Affordable road, rail and air travel means that mass migration is now common for economic reasons and generations therefore tend not to live together or in the same neighbourhood (Abrams, 1978). Despite these complications family ties remain very important to older people (Grundy, Murphy and Shelton, 1999) and the emotional intimacy that they experience through them (as well as that with close friends) becomes more significant as they get older (Carstensen et al., 1999). As in the Newhaven study email was seen as an important additional way of maintaining the sense of connection and intimacy between family members and close friends. This fits with other studies which have looked at older people's use of email suggesting that the maintenance of emotional intimacy within preexisting close relationships is a primary reason for going online and engaging with email (Lindley, 2007 ; Melenhorst, 2002). Again in line with the Newhaven study the emphasis on text-based communication was seen to be wanting in terms of conveying emotional depth (Ruth's example) especially over extended periods of contact.

Accessing Information

Using the Internet to search for information was the second most popular activity for attendees in line with previous research (ONS, 2009; Jones and Fox, 2009). Information seeking has been described as "a conscious effort to acquire information in response to a need or gap in your knowledge" (Case, 2002; pg 5). Attendees' information seeking showed an inclination towards purposeful rather than passive information with attendees searching for information that they could do something practically with rather than just searching for information as a purely cognitive activity. Taken by itself there is nothing unusual about this in relation to other age groups (Case, 2002). However there were aspects of the routes taken to searching by this group of users which did highlight age-related behaviour. The online information seeking encountered at the centre was usually embedded in everyday social practices, that is it emerged as an aspect of ongoing conversations with friends or engagement with other media (newspapers, radio, television, etc) rather than as an overt attempt to access online information. Users would

usually turn up at the centre with web addresses written down rather than engaging in an 'open' search of the Internet. This makes it similar to the information *sharing* seen in the Newhaven study except here the Internet was being used as a proxy for passing on more detailed information. Williamson and Asla (2009) describe a similar kind of information behaviour amongst older people which they call *incidental information acquisition*. They highlight the way that as people get older and less mobile they come to rely more and more on existing forms of social contact as conduits for knowledge of the 'outside world'. At the Drop-in Centre social contact was used in a very similar way by attendees providing them with trusted directions in the unfamiliar informational landscape of the Internet.

Support for Independence

Computers and the Internet can enhance independence in a functional sense for older people by providing access to material resources. These can be acquired through the exchange of money as with online shopping allowing them to overcome mobility constraints associated with ageing, i.e. they can get goods sent to their home. However there was widespread mistrust amongst attendees with regards to the process of buying things online which negated this opportunity. Resources may also be about means of generating an income. By definition retirement reduces opportunities for involvement in economic activity. Online merchant services such as eBay were seen as ways of providing an alternative income and there was great enthusiasm in this regard. Sylvia's example in the Newhaven study also showed the importance of being able to generate an income online and both these examples run contrary to previous research which suggests that online selling is not a popular activity (ONS, 2009).

Establishing Intergenerational Connections

Opportunities to share experience and resources across generations within the family in a face to face manner appear to be diminishing and children are more likely to grow up in homes in which their grandparents are not present (UN, 2007). Despite the dramatic changes to everyday family life in developed society, relationships between alternate generations (i.e. between grandparents and grandchildren) remain very important bonds, continuing to operate over great distances, usually by telephone and written correspondence (Grundy et al, 1999). Broadly speaking computers and the Internet were seen as ways of keeping in touch with younger generations (children and grandchildren). Email now provides another important way in which older people can keep up to date with their grandchildren and its use was evident amongst the Age Concern group for this purpose.

Engaging in Life Review and Reminiscence

Reminiscence and life review are well acknowledged aspects of later life and an important stage in life span development towards the end of one's life (e.g. Butler, 1963; Erikson, 1963, 1986). As discussed in chapter 2, Erikson defined eight life stages as characterising a full life span. He saw each stage as concerned with resolving conflicts particular to that point in life, experienced as crises. The eighth stage, that of old age (65 and beyond), was concerned with the question of whether or not earlier life goals have been satisfied or resolved. Acceptance of the decisions one has made in one's life leads to them being integrated into one's ongoing sense of self. Difficulty in reconciling them may lead to a sense of despair as death comes closer.

Butler (1963) defined the process of life review as follows,

A naturally occurring, universal mental process characterized by the progressive return to consciousness of past experience, and particularly, the resurgence of unresolved conflicts; simultaneously, and normally, these revived experiences and conflicts can be surveyed and reintegrated . . . prompted by the realization of approaching dissolution and death, and the inability to maintain one's sense of personal invulnerability (p. 66).

Computers and the Internet were shown to be relevant here by providing prompts from one's life as opportunities for reflection and as the means for recording one's life history as a legacy to pass on to future generations.

Selectivity

It is possible to understand older people's adaptations to computer use during this phase in terms of *selectivity with optimisation and compensation* (Baltes and Baltes, 1990; Baltes, 1993). At the level of physical interaction with computers, older users are attempting to reconcile their personal interpretations of purpose with how they actually make it do what they expect it to do (i.e. learning and doing the actions needed to fulfil the identified purpose). Selectivity is therefore expressed through the particular sense of purpose that they choose to use computers and the Internet for. The challenge of initial computer and Internet use highlights to an older person their sense of failing physical and psychological abilities when their own abilities fall short of the expectations of the technology. An awareness of their own physical and psychological limitations in this situation allows them to *optimise* their performance to respond to this challenge. They primarily do this by defining their aims very narrowly and then practicing the tasks related to these aims until they can do them easily. *Compensation* also plays its part in maintaining optimum

performance and this appears in the form of external aids to support failing abilities, e.g. notebooks for memory, upturned bifocals for failing eyesight or advice from knowledgeable others to support lack of personal experience.

Implicit Learning – Using Without Understanding

The learning process for attendees emerged when they started to explore the functionality for themselves in spite of their limited understandings. Basic principles of operation (such as the fact that the mouse controlled the onscreen pointer) could be explained but establishing them as embodied skills only progressed through their enactment in relation to onscreen activities. This happened through repetition and trial and error exploration of functionality. The learning in relation to mouse and keyboard activities was largely unconscious with a retrospective understanding coming later which allowed more intentional exploration. By combining repeated embodied experience with the mouse and keyboard with the learning of computer-specific activities a tacit knowledge (Polanyi, 1967) was formed which provided the basis of an ongoing ‘embodied literacy’. This kind of unconscious learning has been described as ‘implicit’ learning (Reber, 1989) and is reminiscent of the ‘enactive’ engagement described by the sensemaking perspective on appropriation (Weick, 2004). This kind of enactive and embodied approach to trial and error experimentation was an aspect of Sylvia’s exploration of online digital photography and a defining element in shifting her use towards deeper engagement.

Literacy

Finally appropriation progressed at the level of communication with the older people in this study developing a new form of literacy in relation to computer and Internet use. This was a largely linguistic endeavour which involved the appropriation of new terminology but also an understanding of the changing role of language as an ‘active’ element in human-computer interaction. Older users accommodated computer use of language (which is logical, interconnected and virtual) by employing approximate mental models which were pragmatic in use though not necessarily accurate (in a design sense). Given that social contact was so important in framing older people’s use of computers both in this and the previous study, navigating this unfamiliar human to computer form of communication in order to engage in (computer-mediated) person to person communication was a significant hurdle for attendees to overcome.

Deep Engagement

The nature of this study, being concerned with novices as it was, did not encounter any users that were deeply engaged.

Summary

In this study the moment to moment learning process that accompanies older people's adoption of computers and Internet was examined by observing naïve older users in an IT drop-in centre with voluntary support. Overall similar framings were discovered at adoption as in the previous (Newhaven) study in terms of what were considered to be relevant uses: social contact, intergenerational connections, supporting independence and sharing/accessing information. Creativity was not seen as a relevant use in this context but life review/reminiscence was. These framings structured and motivated the learning of basic concepts and skills implicit in these older people's use of computers and the Internet. As in the Newhaven study socioemotional selectivity (Carstensen, 1992) had a particularly strong influence on early framings of use and subsequent learning. Selectivity with optimisation and compensation (Baltes and Baltes, 1990) was evident as part of the learning process with regards to the physical and conceptual aspects of computer interaction. There was also a strong element of implicit learning taking place post adoption which emerged through enactive, trial and error use of functionality. This was not accounted for by conscious notions of adaptation but more reminiscent of sense-making explanations of appropriation which focus on self-oriented and personal meaning-making rather than purposeful use.

In the next study a detailed case study of one older computer user is used to follow the learning process further into appropriation elaborating on these self-oriented personal meaning-making processes.

Chapter 7 - Geriatric1927 and YouTube.

Covered in this chapter:

In this chapter one older computer user's appropriation of the website YouTube is examined in depth with a longitudinal study spanning three years and four months. Here the participant lives independently in the community but becomes immersed in an online social context which transforms his social experience. It is here that the study's primary focus lies. In this instance learning support is occasionally provided by family and friends but comes mostly from online contacts. The social context of use is defined by solitary use in an immediate offline sense but occurs in the presence of numerous online social connections. The socially embedded and relational nature of Peter's YouTube activities are clear, supporting his appropriation to a deep level of engagement and highlighting future possibilities for other older computer users. Part one of this study is derived from a previously published paper (Harley and Fitzpatrick, 2009a) and the multimodal analysis used in part 2 of the study comes from another (Harley and Fitzpatrick, 2009b).

Setting/Background

The focus of this study is an 82 year old widower called Peter Oakley who lives on his own in a semi-rural area in the North of England. Like those in the previous studies he lives independently in his community and despite some problems with his mobility due to arthritis he gets around to local shops and friends using public transport and an electric mobility vehicle. Unlike those in the Age Concern study and many in the Newhaven study Peter has already established a basic literacy with computers and the Internet with help from his family and has begun to realise their relevance in his life, creating a dedicated room for computer-based activities within his own home (shown in figure 12 below). During this study his ongoing exploration of the Internet is traced through his appropriation of the video sharing website, YouTube and the effects of his immersion in this online social context with regards to his everyday life. In August 2006 Peter embarked upon a *video blogging* experiment by posting videos onto the YouTube website (<http://www.youtube.com>) under the pseudonym of 'Geriatric1927'. This study

documents his involvement with the website as a particular expression of his appropriation of computers and the Internet.



Figure 12: Peter at home in the ‘sanctuary’ – the room where he does his YouTube video blogging

YouTube¹⁶ is a social networking website (boyd and Ellison, 2007) or SNS started in 2005 where people can upload, view and share video clips. It initially promoted itself as an alternative broadcast medium where video clips from television could be uploaded by users and viewed again after terrestrial or cable broadcast. It maintains notions from the one-way televisual experience, using slogans such as “Broadcast Yourself” and directing users to different “Channels” and “Featured Videos”. None the less its overriding purpose remains largely user-defined and social in nature with social capital underpinning its success and ongoing appropriation for other uses. YouTube allows registered users to post their own videos onto the web and to comment on others’ videos. Some users post regular video diary entries using static webcams whilst others are more experimental, filming naturalistic or scripted events, editing them and adding post production elements before posting them onto the site. Peripheral involvement in YouTube is possible through the viewing and sharing of video content online. Additional opportunities for social interaction become apparent once users sign up as members of the YouTube community. Social connections within YouTube can be initiated by responding to posted videos through subscription or by sending text or video ‘comments’. At its simplest level these

¹⁶ <http://en.wikipedia.org/wiki/YouTube> provides an overview of YouTube, last accessed June 30 2009.

measures provide mechanisms for sharing and giving feedback on videos, beyond this they provide new opportunities for online social interaction.

YouTube like other SNSs (e.g. Facebook or MySpace) is incredibly popular worldwide. Its registered online community is estimated to be over 300 million ¹⁷ and has a predominantly English speaking membership who upload the majority (48.1%) of content there (Wesch, 2008). It has a large influence from the USA with 34.5% of users coming from there (Wesch, 2008), and a monthly viewing audience closer to 135 million who visit and watch 12.9 billion videos without registration (recorded for the month of March 2010¹⁸). YouTube's demographic is dominated by the younger generation with an estimated 50% of those who register on YouTube under 20 years of age (Gomes, 2006) and an average age of 26.57 years (Wesch, 2008). Social networking sites like YouTube are rarely used by the older generation. In the USA only 7% of Internet users over 65 are making use of them (Lenhart, 2009) and in the UK this figure is even lower at 3% (Ofcom, 2009). The use of particular SNS-based activities within this group also appears to be variable with many of them (3% of UK older Internet users) uploading their own self-created content but none posting messages (ONS, 2009).

There are only a handful of studies which have looked specifically at older people's attitudes towards SNSs. Lehtinen et al. (2009) found that older computer users were reluctant to engage with them at all (using Netlog.com as an example) because they had a fixed view of what their computers were for (gleaned from previous work experiences) which did not fit with SNSs. They identified their computers as "work tools rather than for fun or communication" (Lehtinen et al., 2009, p. 49) in much the same way as the adoptees encountered in the previous Age Concern and Newhaven studies had done. Whilst usability problems were also identified in this study (e.g. they could not work out how to upload photos onto the site), the overwhelming conclusion was that SNSs were useless and irrelevant to the lives of these older people, offering opportunities for peer social contact that were incompatible with their real needs.

¹⁷ <http://answers.yahoo.com/question/index?qid=20091026084529AAkA4cW> last accessed 22nd December 2009

¹⁸

http://www.comscore.com/Press_Events/Press_Releases/2010/4/comScore_Releases_March_2010_U.S._Online_Video_Rankings/%28language%29/eng-US last accessed 21st June 2010

Ryu, Kim and Lee (2009) looked specifically at the potential for user-created video content within SNSs by older¹⁹ Koreans using the technology acceptance model (Venkatesh and Davis, 1996). This study showed the positive influence of similar constructs of perceived usefulness (perceived benefit in this study) and perceived ease of use (perceived ease of participation in this study) in determining an intention to adopt SNSs with perceived enjoyment as an additional correlate. Compatibility in terms of values and needs was not found to be significant in this case but the prevalence of life-changing events (e.g. loss of a spouse, death of a father or mother, birth of the first grandchild, etc) and a perceived lack of user resources (in the form of software/hardware, financial resources and knowledge) was shown to impact negatively on adoption intentions.

Given the low uptake of SNSs amongst the older generation the subject of this study, Peter Oakley, is therefore unusual in his participation on YouTube. His involvement there gives us an opportunity to examine how such websites might become relevant and beneficial to other older users in the future. In the context of this study he is therefore treated as a 'lead user' (Von Hippel, 1988) appropriating YouTube ahead of his peers. Examination of his particular appropriation of this online medium can provide insights into its potential for others in his age group through the learning he undertakes, the problems he encounters and his particular innovative uses for it.

Peter started using the YouTube service in August 2006 to post small video vignettes about his life and to comment on certain news items. Since then he has posted a total of 221 videos to YouTube on different themes and his 'channel' has been visited 2,502,071 times with 51,157 of these visitors signing up as dedicated subscribers to his videos (at 31 December 2009). His 'channel' started to become popular almost immediately after he uploaded his first video and his advanced age in relation to most other users of YouTube was significant in him being profiled on the YouTube home page as a highly-viewed contributor. It was at this point that an examination of Peter's appropriation of this particular Internet-based medium began (August 2006).

Peter's appropriation of YouTube is documented in this thesis over a three year and four month period from August 3rd 2006 to 31st December 2009. YouTube video content, text and video comments from viewers and interviews with Peter were all used to develop a qualitative account of Peter's appropriation of this particular online medium.

¹⁹ Over 50 in this case

Part 1 - Early Learning of Computers and the Internet and Discovery of YouTube

Peter's appropriation of this particular online medium implies a certain amount of prerequisite knowledge and skills with regards to computers and the Internet. With regards to hardware, he had to connect up his personal computer, learn how to use a mouse and keyboard, establish a broadband internet connection, install and use his webcam and microphone. In software terms he had to learn how to navigate an operating system, use a web browser, capture video from his webcam and edit his videos. Finally he had to navigate his way around the YouTube website and create an account for himself before uploading his first video. Peter's describes similar frustrations to those encountered by users at Age Concern when he started to learn about computers,

I struggled with all those simple things like any newbie to computers would do... that blasted cursor on the screen kept whizzing off and it took many weeks to get used to this mouse being your control of the screen and in my case what I did was I played card games so that there were quite big images on the screen that I could slide about but it took an awful long time and I don't think people realise the control that is necessary for the control of the computer or the control of the tools that you use (Peter)

Here Peter uses 'meaningless' practice in the same way as those at Age Concern in order to develop the necessary motor skills to use the mouse. He also felt that he needed to know how the computer actually worked, reading books on the subject and building his own computer with the help of his son,

The first thing I did, I got a book from the library which was aimed at children from the age of 5 that explained how a computer worked. It said this is a mother board and there is a thing called a bus and that sends the message there and then there is a thing called a processor and isn't it marvellous" and then, "with the help of my son actually built a computer and knew what all the bits were (Peter)

In relation to the users at Age Concern he would have been considered an advanced user but his adoption of the technology and the establishment of basic literacies are not the subject of this chapter. Here the evolution of Peter's sense of relevance and purpose are examined after prerequisite computer skills have been attained and directed into a particular route (that of YouTube video blogging).

We can assume that active learning was already underway at the point when Peter discovered YouTube and that he had already gone some way to refining his own personal sense of relevance and purpose with regards to computers and the Internet more generally. In interview Peter explained his early interests prior to YouTube as being focused on personal creativity with an underlying social and family-oriented purpose,

Yes I had got some computer skills at that time and I remember I had been to some courses on graphic design and I was and still am very interested in graphic design as a so called artist and I was doing family slide shows and thought they were getting rather boring... and I wanted to add some video content and knew nothing about video at all and I honestly can't remember how I searched out video. It was quite likely that I googled video and with the thousands of pages somehow came up with youtube and when of course when I found youtube I thought what a wonderful website it was and I went on from there (Peter)

Peter's sense of relevance and purpose at this point was similar to that in the other studies with an emphasis on exploring intimacy with family members through his slide shows. However his YouTube videos show him developing a new sense of purpose beyond family concerns and in relation to a new audience emerging within an online social context. Peter's search for knowledge about video making brought him into direct contact with an active community of practice in much the same way as Sylvia's explorations of online digital photography had done in the Newhaven study. This began to reframe Peter's use of computers and the Internet as it had done with Sylvia. The content of Peter's first eight videos and related responses give us the perfect opportunity to examine the way in which his personal sense of relevance and purpose evolved in relation to this online social context and the YouTube-specific learning that took place. This evidence is therefore used as a starting point for understanding his appropriation of YouTube.

Video Analysis 1 - Peter's First Eight Videos and Responses - an Overview

Table 12 provides a summary overview of the first eight videos posted by 'Geriatric1927'. Each video is listed with the title Peter gave it, his description of it, the tags he used, and the video length. A brief description of the content of each video is also given along with the number of views and responses it received (as at December 31, 2009).

In Peter's first video his intentions and sense of purpose remained unclear but were no longer oriented towards family. His decision to make the transition from web surfer to video blogger on the YouTube website was certainly driven by a creative urge but also by a recognition that this was a creative enterprise taking place within a new online social context populated by the younger generation.

it's a fascinating place to go to see all the wonderful videos that you young people have produced. So I thought I would have a go at doing one myself
(Peter - Video 1)

Through videos 1-4 Peter made a point of introducing himself to the YouTube community but remained unsure of what to talk about. In his second video he clarified his intentions as being:

to just blog about things that annoy me and upset me and news items that I think are pretty stupid and things like that and see if I can get some comments from people and maybe get a dialogue going with you wonderful YouTube people (Peter - Video 2)

Despite these initially stated intentions Peter did not pursue such an angle in his early videos. The immediate responses that he received to these videos reinforced his sense of participating in a shared and ongoing project (i.e. that of YouTube vlogging) and he was careful to take any advice offered. His subsequent videos emerged as part of the dialogue that he did get going with the YouTube people and he eventually settled on telling a multi-part narrative of his life story, seen in Videos 5-8.

Table 12: Summary of Peter's first eight videos: title, content description and responses.

Details of Video	Brief Description of Content	Responses (as at 31 Dec 2009)
1. Title: first try Description: My first attempt at video Tags: grumbling bitching griping blogging Video Length: 02:07	Explains his fascination with YouTube and introduces himself; Sets out his intention to 'bitch and grumble' about life; Asks YouTubers to encourage another video maker to come back	Views: 2,829,875 Text Comments: 13037 Video Comments: 118
2. Title: second try Description: Introductory video Tags: blogs news gripes grumbles discussion	Explains how 'people' seem unable to find his first video; Has identified the problem being with the tags that he used. Has introduced different tags with this video; Restates his intentions to blog about	Views: 204, 794 Text Comments: 797 Video Comments: 3

Video Length: 01:17	news items that annoy him	
3. Title: The vicar and the police questions Description: A vicar taken in for questioning about an alleged assault on a young girl Tags: blogs news grumbles China Russia police Video Length: 05:01	<p>Starts with a long title sequence with cloud photos;</p> <p>Talks about a news item on the radio which annoyed him and uses this to highlight the paranoia of paedophilia present in this country and different attitudes that exist in other countries</p>	Views: 176,098 Text Comments: 1169 Video Comments: 4
4. Title: Re: Who are you....Who, Who...Who, Who Description: censor the unsavoury comments and remove and ban members who submit them. Don't stifle the creativity of the young but protect them from abuse of this sort Tags: You Tube youtube jerry video response Video Length: 05:34	<p>Takes the opportunity to respond to another video blogger (the same one he mentions in his first video) who has had a bad experience with offensive comments in relation to a video made by his son;</p> <p>Explains who he is and outlines his position with regards to 'bad behaviour' on YouTube.</p>	Views: 175,261 Text Comments: 1174 Video Comments: 1
5. Title: Telling it all part 1 Description: My life Tags: blogs blues life motorcycles education Video Length: 05:52	<p>First part of his life story;</p> <p>Overwhelmed by the number of responses he had received so far Peter is keen to say thank you and becomes emotional;</p> <p>Sets the scene of his youth, describing background and answering questions received from other YouTubers;</p> <p>Explains his early life during WW2 outlines his experience of school education.</p>	Views: 321, 442 Text Comments: 2539 Video Comments: 18
6. Title: Telling it all part 2 Description: A very quick trip to my conscription into the Armed Forces Tags: people blog war china blues motorcycles Video Length: 06:38	<p>Talks about his early working life in a Public Health Department;</p> <p>Moves on to his experience of the war as a conscripted radar mechanic;</p> <p>Introduces his life long passion for motorcycles.</p>	Views: 180,709 Text Comments: 1285 Video Comments: 10

7. Title: Telling it all Part 3 Description: A change of direction Tags: people blog china motorcycles war Video Length: 08:50	Continues his tales of the war, travelling around Britain as a radar mechanic; Demobilisation and going back to college in Leicester after the war; Meeting his wife; More about his love of motorcycling; Changing career to run his own motorcycle shop.	Views: 159,061 Text Comments: 1048 Video Comments: 7
8. Title: Telling it all Part 4 Description: Self employed, marriage and children Tags: people blogs Video Length: 09:46	Tells about his self employment at the motorcycle shop; His marriage and the arrival of his children; Fostered another child; Starting another business selling bike accessories; Suffering from liver disease, retiring early.	Views: 83,644 Text Comments: 548 Video Comments: 6

Analysing responses from viewers

In total to date²⁰, these first eight videos have been viewed 4,130,884 times, and received 21,597 public text comments and 167 video comments. Through grounded analysis and coding the first 150 text comments were categorised for each video using the categories of technical feedback, comments relating to the YouTube community, content related comments, and personal/emotive responses. These are listed in Table 13 with an example comment to illustrate each.

Table 13: Initial coding scheme for comments made in response to early videos

Legend	Comment Category	Example Comment
	Technical Feedback	<i>"you can also change the colors on Windows Movie Maker"</i> Gt, 21, US – response to Video 2
	Personal/Emotive Responses	<i>"great video...your so cool"</i> Fr, 18, country unstated - response to Video 6
	Comments Relating to The YouTube Community	<i>"I'm gonna Email the Owner of YouTube and see if we can get him a "Director's Account"</i> KPW, 34 - response to Video 8
	Content Related Comments	<i>"Thank you for sharing you experiences! That camp sounds like it was hell"</i> Sl, 18 - response to Video 6

²⁰ 31st December 2009

The distribution of comments in response to each of the eight videos is depicted in Figure 13 below. A comment could have more than one category associated with it.

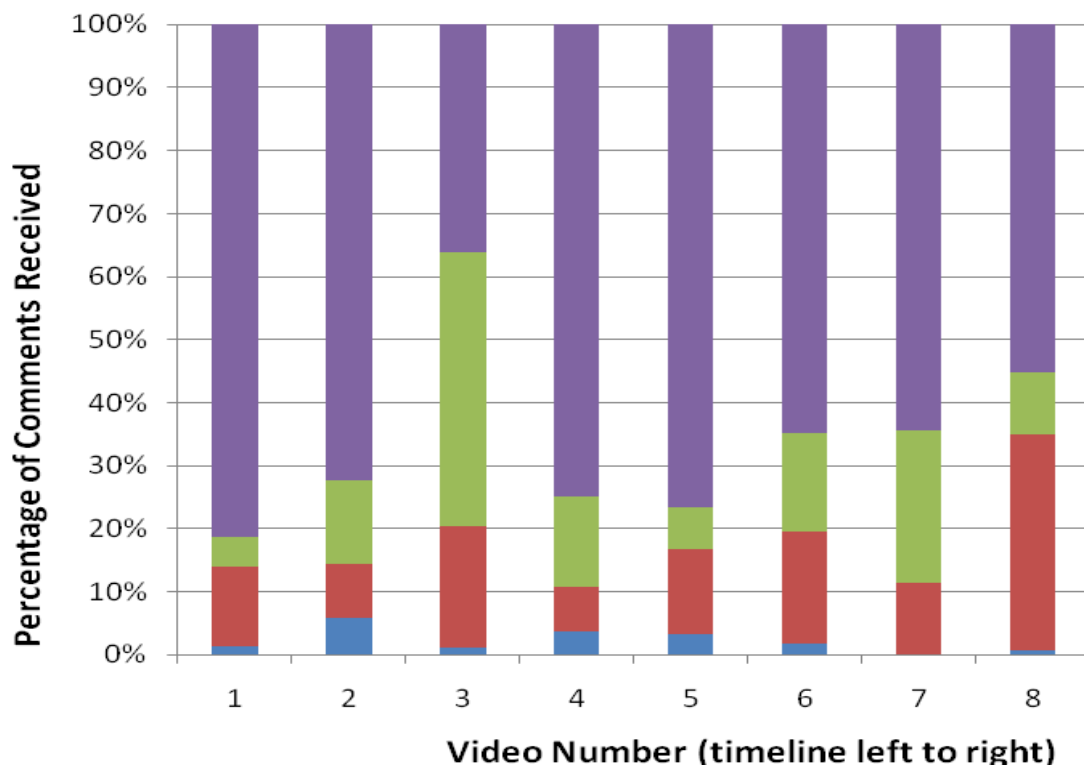


Figure 13: Categorisation of responses (see legend in table 13) to each of the eight videos

The overall data about number and distribution of responses indicates the strength of the response Peter received from the YouTube community about his videos. In the following section Peter's appropriation of YouTube is discussed in relation to these responses. This is done by identifying Peter-centric themes that relate to the initial codings: learning technical literacy (technical feedback); the nature of social contact (personal/emotive responses); evolving community through discourse (comments relating to the YouTube community); and co-creation of content (content-related comments). Collectively these help to unpack the nature of the interactions that took place and the ways in which Peter's initial understandings of purpose played themselves out through his emergent relationship with the YouTube community.

Learning Technical Literacy

One of the most telling points of interaction between Peter and the YouTube community was the way in which he was able to develop his technical skills through the advice and help given to him by others. This process of learning within an existing community of practice with an acknowledged common aim contrasts sharply with the situation for older people learning basic computer skills who must learn in isolation (as with many in the

Reduced Horizons study except perhaps Sylvia) or with the help of a shared instructor (as in the Age Concern drop-in centre). The skills that Peter learned were related to producing good videos as well as how to use the technical aspects of YouTube to maximum effect. Moreover the enactment of these technical skills as an aspect of communication rather than as a result of overt teaching and learning fostered a supportive learning environment for Peter in which the literacies associated with video blogging could be learnt as a byproduct of productive and meaningful social interactions.

Peter's videos show that he did have a reasonable degree of technical literacy already. He trained as a radar mechanic during the Second World War and later developed an understanding of mechanical engineering through running his own motorcycle shop and constructing motorcycle parts using lathes. From interviews with Peter it is clear that such experiences gave Peter a basis for learning new technical skills but they did not prepare him directly for the skills involved in producing his own videos and uploading them to a website. Peter makes it clear from the outset that he is open to receiving help. In describing his first video Peter says,

As you can see, if this ever does get uploaded to YouTube, I need a LOT of help... I hope you will bear with the sort of amateur production I have made (Peter - Video 1)

His confidence in his own abilities was faltering at this point, both in terms of his ability to express himself through his videos and in terms of producing and uploading content onto the YouTube website. None the less what is interesting is Peter's positive attitude towards using the technology in spite of having a limited understanding of what he was doing. In the Age Concern study and with Sylvia in the Newhaven study, such an attitude was central to learning new technical skills. In interview at a later date Peter described his approach to using computers more generally in the following way,

I'm rather like a child in that I do things in a practical way, I'm not frightened of the computer any more...I do everything in an experimental way. I don't think some older people would do that, this is what young people do all the time they never look at books they just do it (Peter)

What begins as an individual effort by Peter soon develops into a collaborative endeavour through the comments he receives from his viewers. They give him feedback in a number of ways which help him to develop his video presence within YouTube and the literacy to

back this up. The following are examples of viewers' comments that critique the technical aspects of his video production and give him technical advice on how to improve it:

Try putting music into the video through the program you are using, it would sound much better :) (ZS²¹, 19, US - response to Video 1)

you can also change the colors on Windows Movie Maker. When you are typing your text down by where it says animation or what ever to change the display of your text it should be right there. Just click that and you can change the font and then color is right under the font (Gt, 21, US – response to Video 2)

Peter is quick to take advantage of the advice given and the changes in production qualities and techniques in subsequent videos show evidence of his learning. His first video is tentative and short. After a simple title screen and a still photograph of himself taken with his webcam he starts the video proper, using a radio playing in the background to add a blues soundtrack. The sound levels are turned up so high that the music is distorted. Peter sits in front of his computer's webcam and nervously introduces himself to the YouTube community. The angle of his webcam means that his computer screen reflects back onto the lenses of his glasses. By the time of his third video his presentation is looking much more professional. He has learned how to add post production elements via his computer to give a much clearer soundtrack and multiple photographic images, adding interest for the viewer. He has adjusted the angle of his chair in relation to his webcam so that there is no glare on the camera. Title sequences become more complex and along with incorporated photographic elements they start to define a narrative which becomes central to Peter's involvement. In interview with Peter it became apparent that these videos were made without rehearsal and that the videos themselves were used as a way of further developing his video making skills as opposed to him practicing them in isolation. That is, his literacy emerged as an aspect of his active involvement with the community rather than as an exercise in technical competency alone.

Some of Peter's technical literacy increased as a direct result of the feedback that he received and he was quick to thank his viewers for their help. Comments about technical issues in his videos receded, as can be seen in Figure 13. His viewers were pleased to point out his improvements and compliment him on them,

yay the sound is better (En, age unspecified, US - response to Video 3)

²¹ Peter's respondents are identified within the text by pseudonyms rather than their original YouTube names.

The advice that Peter received was not just about helping develop his technical skills with video. It was also about the more social aspects of being a 'YouTuber'. In the following examples, fellow YouTubers suggest to Peter how he could better exploit some of the technical mechanisms within YouTube to promote his videos and indirectly to support his social goals,

Put names of popular tubers in your tags, you'll get more views. It's kind of cheating I guess though... (MC, 28, Canada – response to Video 2)

Dont worry, to get your videos noticed, post them as a responce [sic] to other peoples videos (Fb, 26, Canada - response to Video 2)

This was useful advice since access to content through YouTube is primarily orchestrated through a ranking system. The videos are ranked in a number of ways: most recent, most viewed, most discussed, top rated (by viewers), most linked (to from other websites). Using a video to comment on a popular video therefore gives the video maker access to a larger audience. There is evidence of Peter taking up these suggestions in Video 4 where he responded to 'jerry', a popular YouTube contributor, adding his name as one of the tags. YouTube also uses a mechanism for differentiating the status of video producers within the community and displays this as part of their profile. 'Director' status allows video makers to produce and upload videos over 10 minutes in length. This also provides viewers with some gauge of quality. Peter receives a number of comments encouraging him to apply for Director status so that he could make longer videos, giving him tips on how to succeed,

If I were you, I'd make myself look good by exaggerating the number of hours of video you have to share. That way, you're sure to get a Director's account. :
) (BT, 39, country unstated - response to Video 5)

Peter did in fact achieve Director status very soon after his eighth video.

The Nature of Social Contact

Perhaps more interesting than the technical advice Peter received was the way in which he was accepted and related to by individuals within the YouTube community. This is captured in the responses categorised as 'personal/emotive'. Here the nature of social contact is being defined for Peter in terms of its emotional tone and expectations of behaviour, helping him to establish a role for himself within the community. In both the Newhaven and Age Concern studies, computer-mediated social contact was focused

almost exclusively on existing family and friends (except for Sylvia's example in the Newhaven study). Peter's openness to new social contact appears to contradict these examples of socioemotional selectivity theory (Carstensen, 1992) making this aspect of his YouTube engagement important to understand. Peter was certainly aware of his presence on YouTube as a newcomer and as an older person in a predominantly youth oriented medium. He was also keen to find out what younger users thought of his presence there. To explore the response he did receive, the 'personal/emotive' responses were analysed further using a set of sub-codes to show more nuanced responses:

Video compliments: those that showed an appreciation of the video, i.e. that they liked or enjoyed watching it.

Positive emotional responses: those which expressed overt positive emotions towards Peter rather than to the video, e.g. expressions of familiarity and affection.

Playful or teasing responses: those which joked around at Peter's expense but with an emphasis on fun.

Negative emotional responses: those that directly insulted Peter or expressed overtly negative attitudes towards his videos, e.g., using swear words and other derogatory terms.

Age related comments: those that explicitly mention Peter's age.

Figure 14 shows the distribution of these different kinds of personal/emotive comments over the first eight videos.

Table 14: Coding scheme for personal and emotive comments made in response to videos

Legend	Comment Category
	Negative Emotional Responses
	Playful or Teasing Responses
	Video Compliments
	Positive Emotional Responses
	Age Related Comments

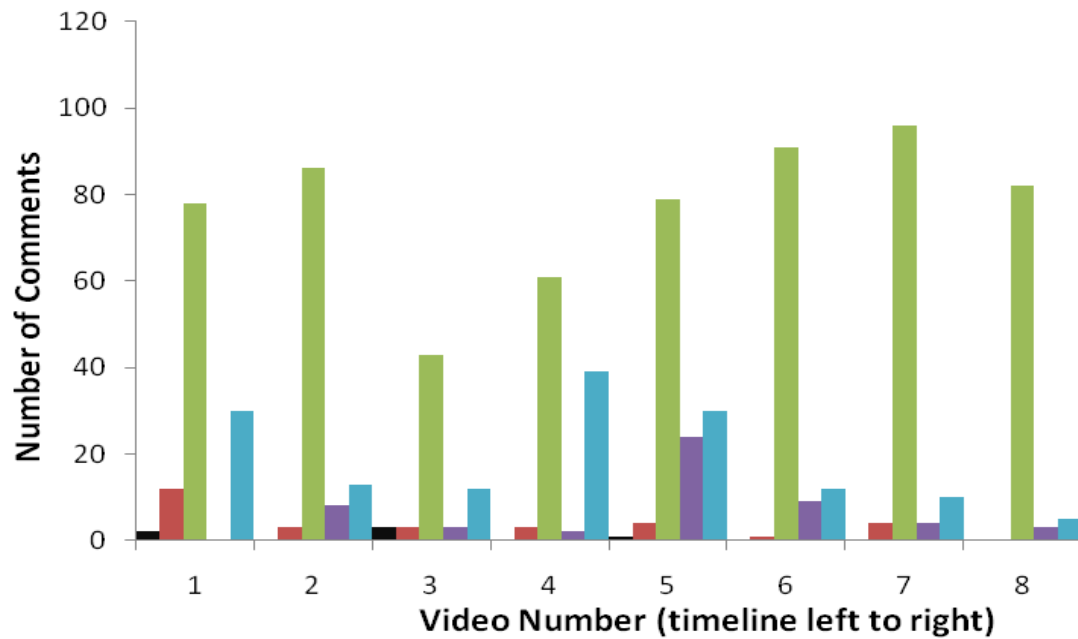


Figure 14: Distribution of different sub-categories of personal and emotive responses

One might expect that ageist stereotypes held by his younger viewers might present an obstacle to Peter's acceptance (Nelson, 2005) but for the most part this was not the case. The reactions to Peter's videos remained consistently and overwhelmingly positive and complimentary, with very few negative comments. For example, of the first 150 comments received by Peter for his first video, 108 of them were positive and complimentary in some way and only 2 of them were negative. In fact, across all of the videos, 'video compliments' form the majority of responses. This did not go unnoticed by the viewers themselves. As one viewer pointed out:

Wow, this video probably breaks all YouTube records of the highest density of pleasant comments ever seen on a video, much less one that's been featured. How respectful we all are! My faith in humanity is boosted just a skosh. (Pp, 22, US - response to Video 1)

While compliments about people liking his videos were consistently high throughout, 'positive emotional responses' to Peter himself only started to emerge in response to video 2 and, while continuing throughout, peaked at video 5 when he started to tell his life story. The content of these responses showed a high level of personal identification and empathy with Peter,

I love you! (Od, 28, Canada – response to Video 8)

omg...i cried...i feel like such a pansy...but i don't care...you are a very wonderful person...i will look forward to more of your videos (Md, 19, US – response to Video 5)

At this stage Peter was still trying to establish his own sense of purpose within this new found online community. Such positive emotional responses helped him to gauge whether or not he was doing the 'right' thing. His emerging role of life history teller was clearly something that was appreciated by his younger audience and something which carried personal meaning for Peter. As will become clear in the following section on evolving community through discourse, not all of Peter's video roles were accepted in the same way.

Given the YouTube name that Peter chose and that video was the medium, Peter's age was transparent from the start. Early viewers were keen to comment on Peter's age as something to be remarked upon in its own right and to acknowledge his video achievements and YouTube presence in respect of this:

I know many 40 year olds that can't find the power switch to a computer. I think its great that you are showing such "thirst for knowledge" of exciting new tech that you could very well ignore. Keep the videos coming. (Bk,19, US – response to Video 2)

Explicit comments about Peter's age decreased with time as his viewers came to know him as an individual. Peter's fourth video, which was in response to another popular YouTuber, jerry, makes connections with another group of viewers. This fresh introduction to a new audience initially brought more comments about his age but these also subsided. Figure 14 illustrates this point.

Interestingly, as Peter starts to tell his life story in video 5, his age and being an 'old person' becomes less of a topic worth remarking on in its own right, as seen by the steadily decreasing age-related comments. Instead people start responding to Peter who, by virtue of his age, has a story to tell that they find engaging and they start to relate to him in a much more personal and intimate way. This relationship starts to be likened to a familial intergenerational relationship such as that which might exist between a grandfather and grandchild – age still factors here but is now embodied in the context of a relationship, either by analogy or by surrogacy, as illustrated in the following comments (coded as 'positive emotional responses'):

You remind me of my Grandad, who lives on the other side of the world, and is dying of cancer, I miss him so much, so your posts bring a tear to my eye. Thankyou. (Ck, 20, UK – response to Video 5)

I wish you were my grandpa :) (Jx, 21, US – response to Video 3)

The reaction of Peter's viewers to his videos does not appear to come from some sense of politeness or over accommodation in respect of Peter's age as is often the case with intergenerational meetings (Williams and Nussbaum, 2001). On the contrary there is something about the intergenerational nature of this communication which gives it a gravity and sense of mutual respect.

..you and your stories are a lovely breath of fresh air after all the sensationalists and emo kids. I think a lot of people wish they could have heard this kind of thing from their own grandparents. (Ps, 23, country unspecified - response to Video 5)

We need a voice on here that's "been around the block" a little" (Lt, 27, US – response to Video 4)

Evolving Community through Discourse

Text comments that appear in response to particular videos on YouTube are not always directed at the producer of the video but to the community as a whole. In this way the text comments can also serve as a space for grounding and contextualising public debate. Often videos and the comments they engender also become places for the community itself to evolve its own sense of who it is and what it deems to be acceptable behaviour. In Peter's case the importance of his presence within the YouTube community becomes a matter for debate of itself. Indeed it has a role to play in defining what the nature of the YouTube community is. This is seen in the discussions surrounding Peter's third video, entitled "The Vicar and the Police Questions", which is followed by a 'blip' in relation to his 'positive emotional responses'. The reaction changes dramatically with proportionately more content and community related comments (see Figure 14). In this video Peter addresses a topic which could be viewed as poignant to the YouTube community overall and to his involvement with the community, namely the paranoia experienced in western societies with regards to affection expressed from an older person to a younger person. Opinion is divided amongst Peter's viewers on this subject and the ensuing polemic that takes place about the role of older people more generally in YouTube dominates the comments and serves to bring these issues out into the open. Concerns are expressed about paedophilia

and the general distrust of older men in authority. Peter's involvement with YouTube is itself open for criticism as the debate becomes more and more heated. The resolution of conflicting opinion within the community in Peter's favour ultimately highlights Peter's genuine intentions with regards to YouTube and serves to seal his acceptance within the YouTube community. This point seems to represent a rite of passage for Peter into the YouTube community and helps to define his ongoing role there.

This discussion around the third video shows that Peter's presence within the YouTube community, as an older person with the suspicions that aroused, seems to have had an impact on the community itself in terms of its own dialogue. The conflict resolution over Peter's place in YouTube highlights issues of authenticity which are ongoing within the YouTube community.

This is contrasted by the case of 'lonelygirl15'²². At the same time as Peter's videos are appearing on YouTube another YouTuber, lonelygirl15, is documenting her teenage life with her boyfriend Daniel. YouTube viewers have become suspicious that lonelygirl15 is acting and that the events taking place in her life are actually fictitious. It transpires that lonelygirl15 is in fact a creation of a budding Hollywood screenwriter and filmmaker (Glaister, 2006).

Peter's home spun tales of everyday life for an older person in England are seen as the antithesis of this kind of deceptive mass media approach to self promotion and for some YouTube members represent what they would like YouTube to become.

You are the kind of person this bloody thing is crying out for (Pd, 34, UK – response to Video 4)

Peter's popularity within the YouTube community increases as it begins to be picked up by other internet sources. This begins to happen around the time of the eighth video. This is seen by Peter's viewers as a positive reflection on the community and text comments which are directed to the community as a whole become more prominent, as seen in Figure 13. Some of these are about making the community aware of Peter's growing popularity whilst others are keen to show their allegiance to Peter in a more formal way:

²² <http://en.wikipedia.org/wiki/Lonelygirl15> outlines the saga of lonelygirl15 on YouTube, last accessed Dec 19 2006.

i cant believe this guy made AOL News!!! Keep em comin Pete (Pj, 24, UK - response to Video 8)

I joined the Fanclub of Geriatric1927.
<http://www.youtube.com/group/peterfans> (Jm, 32, Germany - response to Video 8)

Co-creation of Content

Apart from the technical, emotive and community responses, Peter also received many responses from people wanting to engage in a dialogue with him about particular topics, either responding to the content of the videos he had made or requesting/suggesting new topic areas that they wanted to hear about from him. Thus the spoken narrative on Peter's videos emerges through an ongoing process of collaboration and co-creation with his viewers.

The title sequence for Peter's first video forewarns the viewer of "geriatric gripes and grumbles" and this appears to be an intended theme. Peter also enters accompanying tags for the first three videos which include "gripes, grumbles and bitching". However this does not materialise in what Peter actually talks about in his videos, as one of his viewers points out:

Dear Mr. Geriatric1927: Bitching, grumbling and griping...Yay, that will be fun!!! But you really did not bitch, grumble and gripe in this intro video so, I've become a subscriber and await your next episode. (Qt, 56 ?, US - response to Video 4)

You are very polite with your grumbles and gripes! (Ye, 31, Canada – response to Video 3)

His first four videos do not have any consistent themes and instead contain varied content, ranging from general introductions and intentions, commentary on news items and commentary on YouTube itself. However, from the first video, his viewers show a keen interest in suggesting topics for him to discuss. Over the course of the first eight videos, his viewers suggest varied subjects as depicted in Figure 15. The most popular subject request was about his experiences in the second world war (33%) closely followed by people wanting to know about his opinions as an older person (20%) and his wisdom (9%). The following illustrate some of these requests:

you are so refreshing and real. thanks for contributing to the you tube community. I would love to hear bits of your wisdom any tips on living life better or to its fullest (Gg, 34, US - response to Video 1) [wisdom]

tell us about what life ws like growing up during the war (Is, 20, UK - response to Video 2) [the war]

i look forward to hearing more of your thoughts and opinions, as i always do with older people. (JT,100²³ - response to Video 4) [older people's opinions]

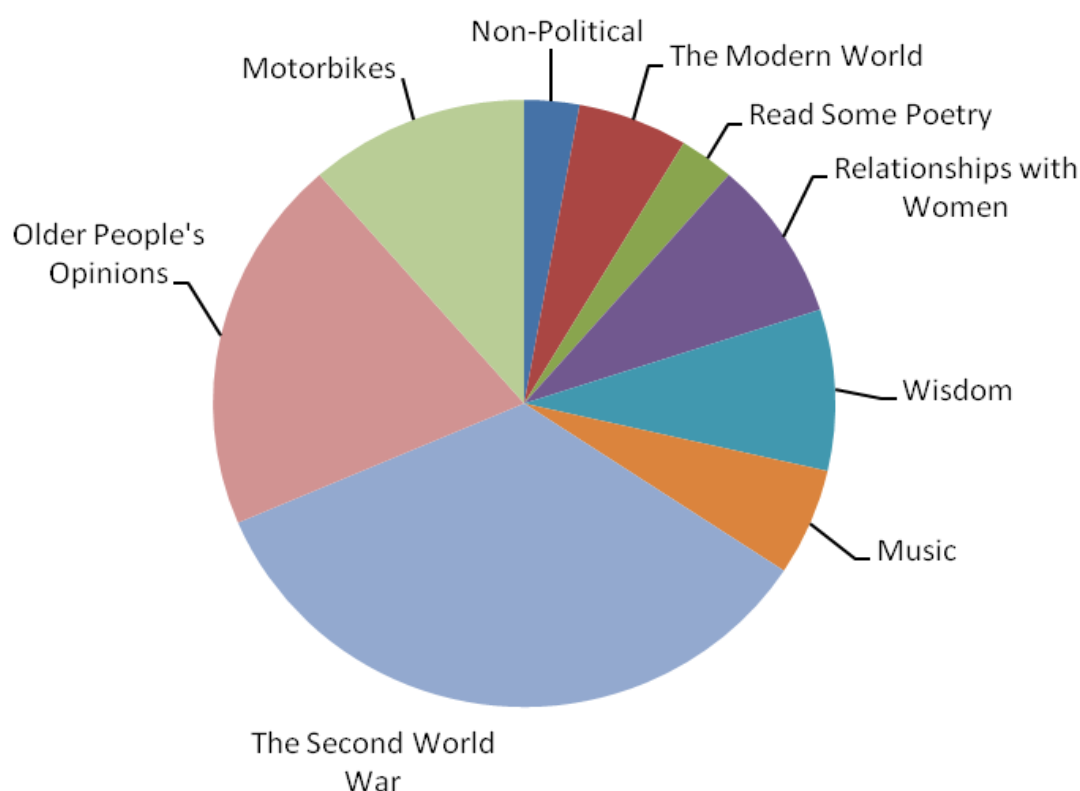


Figure 15: Subjects suggested in viewer comments for Peter to discuss in his videos.

Peter does not address any of these suggestions directly but as a result of this, a narrative starts to coalesce in Video 5 around a new theme – that of recounting his life story – into which he manages to incorporate many of the subjects as he goes along. The only suggested subject which he declines during these eight videos is that of reading some poetry.

²³ It is clear from the videos made by this YouTuber that they are in fact much younger than 100 years old but more likely to be in their teens.

Peter recounts his life story through a series of videos entitled "Telling it all". In the first 4 of these videos (videos 5-8) Peter gives a broad outline of his life by describing some of his major life events. He starts by giving a largely factual account of his youth around the beginning of the second world war. He outlines his grammar school education and his first job in a public health department. He moves on in the second part of his life story to talk about his involvement in the war from conscription as a radar mechanic through to the end of the war. Peter makes a point of not glamorising his experience of the war nor does he give a historical account. He focuses on aspects of his life which brought him enjoyment at the time, introducing elements such as his passion for motorbikes.

In the third part of his life story (video 7) he recounts the gratitude that came with the end of the war and his demobilisation. Peter becomes more relaxed with his storytelling, drifting away from the presentation of factual information and injecting humorous anecdotes into the narrative. In talking about his demobilisation he says:

When they demobilised you they kitted you out with a new set of clothes...the silliest thing was, also a Trilby hat (laughing to himself) – well there was no way a young man was going to wear a Trilby hat ! (Peter - Video 7)

Peter explains how after the war he returned to his previous job and then moved to Leicester to study where he met his future wife. He then describes a "*big change of life*" which took place when he decided to pursue his passion in motorbikes by making it a more central focus to his life. Peter explains how he took a job in the motorbike industry because:

it was what I'd always dreamed I'd wanted to do (Peter - Video 7)

Later when he and his wife decided to start a family, Peter became self employed.

The fourth part of Peter's story (video 8) describes the period of his life when he was running his own business and bringing up his family with his wife. He describes this as a stressful time establishing the security of his family but moves on to talk at length about his adopted son with whom he continues to have good contact. After a brief diversion in which Peter notices his "favourite pop song at the moment" playing on the radio, he returns to his life story. He concludes the video by talking about his happy marriage to his wife and his early retirement as a result of a liver complaint.

Peter's skill in telling the story means that topics continue to be suggested as his viewers become more curious about the story that is unfolding. Peter is careful to point out when

he is responding to viewers' suggestions whilst he is talking in the video which gives the impression of an intimate dialogue between friends. For instance when Peter introduces his wife into the story of his life he says:

You've been dying for me to tell you that haven't you (Peter – Video 7)

Passing his life story on to others becomes an imperative for Peter. It is this opportunity that makes the YouTube experience so fulfilling for him, defining his role within the community and giving him a strong sense of purpose for making his videos. During the story telling itself Peter becomes completely immersed in what he is doing, closing his eyes and appearing to 'relive' moments from his past, at times losing track of how long he has been talking on the video. This is a profound experience for Peter.

His relationship to the technical aspects of his video making also takes on a different priority, only being important in so far as the technical aspects support Peter's telling of his life story. As he states:

the arty farty stuff at the front is irrelevant...I can't waste my time doing something else because it's so important that I get this to you as quickly as possible (Peter – Video 5)

It appears to be as meaningful for Peter's viewers as it is for him. As one viewer explains:

Thank you for taking your time to share with all of us your stories and interesting life experiences... For us who are younger than you, well, not even that, even if we all were the same age, it'd be just as interesting (JC, 19, US - response to Video 5)

Discussion

In this first video analysis Peter's sense of relevance and purpose in relation to computers and the Internet shifted from a creative and family-oriented one to something that remained creative but was also defined by new social contacts, intergenerational connections and engagement in reminiscence or life review. These constituted Peter's reframing of computer and Internet use in relation to YouTube and express selectivity in ways not dissimilar to the previous studies. However Peter's appropriation of YouTube also shows the truly relational nature of these endeavours in a way that was less apparent in the previous studies (except perhaps Sylvia in the Newhaven study). Like Sylvia's appropriation of Redbubble, Peter's appropriation of YouTube is not only concerned with his own interpretations of its relevance and potential in his own life but also with sharing

and negotiating such interpretations with others in relation to ongoing YouTube use. Indeed it is this grounding in social shared experience that makes it a meaningful and rewarding experience for Peter, both relevant and beneficial.

New Social Opportunities and the Nature of Social Contact

Social motivations were there from the start for Peter. However the kinds of social connections emerging through YouTube were not the same as those being pursued in the previous studies. The connections made by Peter point to '*global*' possibilities rather than familial or local connections. In the Newhaven and Age Concern studies it was primarily 'family' connections that were the main concern for the older participants through their use of email. Indeed many solutions that attempt to address social isolation through technology take a similar stance focusing on connections with family members (Consolvo, Roessler and Shelton, 2004; Mynatt, Rowan, Craighill and Jacobs, 2001) or those that exist within an older person's local geographical community (Reed, 2003). These were also strong in the Newhaven study. In Peter's case in spite of reduced mobility his engagement with YouTube has allowed him to enter a new social world bringing him into contact with a community of people across the globe who were previously unknown to him. He has made contact with people in countries from China to Sweden and Canada to Spain. Beyond the obvious shared interest of video blogging, Peter has shared a dialogue with like-minded individuals interested in motorbikes, blues music and the hypocrisy of politicians, becoming part of virtual 'communities of interest' (Carotenuto, Etienne, Fontaine, Friedman, Newberg, Muller, Simpson, Slusher and Stevenson, 1999). This appears to be contrary to expressions of socioemotional selectivity (Carstensen, 1999) seen in the previous studies and others (Lindley, 2007 ; Melenhorst, 2002) which suggest that older people are primarily interested in using computers and the Internet to pursue preexisting and emotionally intimate relationships as they get older. Whilst intimacy appears to be a feature of Peter's YouTube communications they are with a previously unknown audience where he is making new social connections. Indeed the whole idea of being selective about one's friends seems anathema to Peter's whole YouTube endeavour.

Intergenerational Connections

The very nature of the YouTube medium as a young people's medium, as evidenced by the dominant age groups on the site, set this up not just as global social connections but more importantly as *intergenerational global connections*. Interestingly, while the dominant ages on YouTube were 12-17 year olds, the dominant age groups responding to and interacting with Peter tended to be a little older, late teens, twenties and early thirties; the age of Peter's viewers in the sample ranged from 14 to 56 years of age with a mean age of 26.7

years. It appears that one of the main hooks for Peter's continuing engagement with this global intergenerational community has been the telling of his life story. For Peter, this is an opportunity afforded by YouTube that might not have arisen in the mundane concerns of everyday family life. For his audience, this is a personal lived history that they clearly appreciate.

The intergenerational contact available through YouTube enabled Peter to learn quickly about the technology that he was using. This highlights the way in which ongoing intergenerational involvement and technological proficiency with these technologies are related. This is supported by other studies in which grandchildren have been shown to be a significant source of learning for grandparents when it comes to information technology (Fitzpatrick and Singer, 2007; Selwyn, 2005). The segregation of generations and the social isolation often experienced by older people can reduce their exposure to new uses for computers and the Internet and hence their opportunities for learning about them. YouTube has provided Peter with opportunities for reframing computers and the Internet by re-connecting him with younger people beyond his family network, in turn giving him new opportunities to learn.

Intergenerational research in developed societies has shown that when face to face contact normally occurs it tends to be initially plagued by mutually held negative stereotypes. Younger adults' tend to think of older people as being of ill health, asexual or impotent, unattractive, suffering from mental decline, being useless, isolated, lonely, poor and depressed (Palmore, 1990; Kastenbaum, 1997; Williams and Nussbaum, 2001) and will assume a patronising tone which infantilises the older person they are attempting to communicate with (Ryan, Bourhis and Knops, 1991). The communication taking place between Peter and his younger viewers on YouTube does not suffer from these stereotypes (Gonzalez and Kurniawan, 2008) and there are obvious efforts to establish common ground from both generations. Kaplan, Higdon, Crago and Robbins (2004) in their study of intergenerational initiatives suggest that "before intimacy can be established, there needs to be a period of communication that allows for safe and surface-level contact" (Kaplan et al., 2004, pp140). YouTube facilitates this kind of contact by creating a 'public' meeting place where videos are accessed transparently. Peter's younger viewers are able to view and listen to him without necessarily engaging in a personal dialogue with him. This allows preconceptions of Peter based on his age to be undermined before they are given voice. When Peter's younger viewers do choose to respond to him by video it seems that they are not responding to a stereotype. The same of course goes for Peter.

Reminiscence and Life Review

The process of reminiscence and life review that Peter employs in his story telling is something that is encouraged by his viewers. As discussed in the Age Concern study life review such as this has been identified as a major developmental activity associated with ageing (Butler, 1963; Erikson, 1963, 1986). This understanding underpins much of the reminiscence work that currently takes place with older people in care settings (Bornat, 2001; Gowans, Campbell, Alm, Astell, Ellis and Dye, 2001). The importance of story telling and reminiscence amongst older people is already recognised for its positive effect on well-being particularly for those with dementia (Woods, Spector, Jones, Orrell and Davies, 2005). However what can be seen with Peter's example is reminiscence occurring 'naturally' within the context of emerging interpersonal relationships and engagement with an interested community of people, and not as a result of therapeutic intervention. Far from being an activity directed *at* an individual it is a form of interaction that emerges *within* the intergenerational context, through a process of co-creation. The role of life history teller also provides Peter with an acceptable means of establishing himself within the community.

Peter's telling of his life story is part of him working through his personal life's dilemmas and attempting to resolve them in his own mind. YouTube offers Peter a social context in which to do this reflection and to question what his life might mean to others. In particular, it provides Peter with an opportunity to interact with the younger generation in a safe and mutually supportive way. Hence, the dialogue that takes place between Peter and his viewers on YouTube highlights the relevance of an intergenerational context for this kind of interaction. This is not a selfish pursuit but one which is oriented towards and shared with the younger generation. Peter's reorientation towards the younger generation has a cultural and spiritual dimension to it which goes beyond that of self interest. Such an altruistic turn in later life which expresses an affinity and continuity between generations is characteristic of gerotranscendence (Tornstam, 1989; 1996) which shows Peter's ongoing development of self towards transcendence as an aspect of his experience of ageing.

Active Learning

From the beginning of Peter's YouTube involvement he was already engaged in the active learning process with computers and the Internet that was identified at the Age Concern Drop-in Centre. He had already acquired basic computer and Internet literacy and an exploratory approach to using the technology. The fact that his active learning emerged into a pre-existing online community of practice (Lave and Wenger, 1991) had important implications for its ongoing trajectory that show similarities with those discovered by Sylvia in the Newhaven study. His engagement with the YouTube community encouraged his mastery of the underlying technical literacies specific to YouTube vlogging but also transformed his understanding of what computers and the Internet could do for him. The incentive of social contact within the community represented a strong motivation for him to master the technology in the first place and influenced the way in which his initial sense of purpose was realized by defining the emphasis of his videos. Ultimately the embedding of his learning in an ongoing community of practice grounded it in meaningful activity, providing a new role for him and opportunities for his own self expression.

Peter's active learning process was also dependent upon reciprocity within this intergenerational online context. Through YouTube Peter received advice about technical issues and reflections on his life story and his viewers' enjoyed the passing on of wisdom from Peter's lifetime of experience. The culture of YouTube with its emphasis on the free exchange of knowledge, opinion and expertise promotes reciprocity as part of a collaborative learning process in which active experimentation and freedom of expression are encouraged. These aspects of YouTube have certainly aided Peter's appropriation of it.

Part 2- Peter's Continuing Appropriation of YouTube

In the time that followed Peter's early videos his involvement with YouTube developed further still, having a number of other influences on his daily life and the way in which he conducted himself online. Subsequent analysis of Peter's videos and online interviews with him made it possible to document his further appropriation of YouTube.

His emerging global popularity meant that he began to attract a great deal of unwanted media attention (e.g., BBC News²⁴ and CNN²⁵). This attention was initially overwhelming for Peter with him staging his own 'online death' by filming his own chair empty and declaring his departure from YouTube on 22 August 2006²⁶, not long after the period covered in the first video analysis. Three days later and his YouTube audience had convinced him to stay, with another instalment of his life story appearing on 25th August 2006. In this video Peter explained that the personal relationships developing for him through YouTube had become so important that he felt a strong obligation to maintain these connections despite the unwanted attention of the media. This was an important turning point for Peter in terms of him acknowledging the significance of his involvement in the YouTube community and as an indicator of his deep engagement in this online social world.

His initial reluctance to engage with the media soon waned after a personal visit from a BBC producer and there were then visits from news crews from around the world (including Germany, New Zealand and USA) as well as invitations to make advertisements and documentaries. He took part in an episode of the Money programme (16th February, 2007) as a well known exponent of self-created media content or 'DIY TV' and later in May 2007 he was recruited for 'the Zimmers' band, a rock group made up of older people as part of a BBC documentary called 'The Great Granny Chart Invasion' (Power to the People, 28th May, 2007). As a group they were later to release a cover of the Who song "My Generation" and tour the country with occasional gigs to raise awareness of ageism. Peter was also invited to attend a number of high profile meetings as a YouTube celebrity including the World Economic Forum in Davos (January 2008) ²⁷ which he decided not to

²⁴ <http://news.bbc.co.uk/1/hi/business/6365389.stm>

²⁵ CNN Connects: Our Networked World (2007). CNN, 26th January at 0330 IST

²⁶ Video entitled "Telling it all 11" Available at <http://www.youtube.com/watch?v=VH-WMj8KLC0>

²⁷ <http://www.weforum.org/en/events/ArchivedEvents/AnnualMeeting2008/index.htm>

attend and a meeting with the Queen at Google UK HQ (October 2008)²⁸ which he did attend.

Peter's video making continued as well of course. He carried on telling his life story through YouTube but also started to experiment with other content and using different presentational styles, becoming more polished and confident in his delivery with practice. Peter had started to integrate YouTube into his daily life providing him with a place to express himself and meet new people. During this second period of analysis Peter's further appropriation of computers and the Internet to a deep level of engagement in YouTube is examined.

Video Analysis 2 – Three Years and Four Months of Peter's Video Making – an Overview

In this second study Peter's continuing appropriation of YouTube is considered by analysing the content of the 226 videos made by him during the three years and four months that his participation with YouTube was studied. Figure 16 below shows Peter's output in terms of video making during that period.

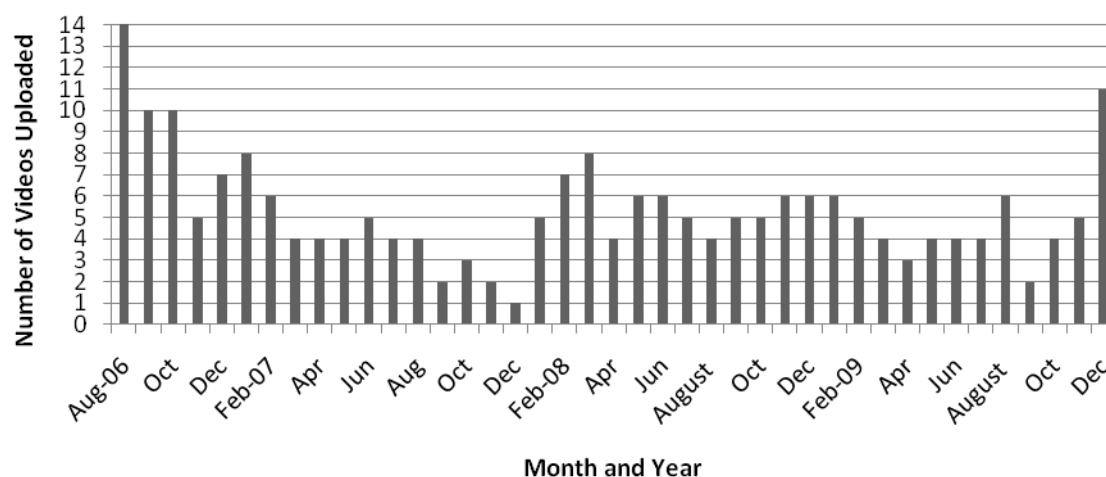


Figure 16: Peter's video making figures from 5th August 2006 to 31st December 2009

The content and style of Peter's videos continued to evolve during this time. He eventually moved away from the reminiscence and life history emphasis that he had established early on and started to experiment with other content and presentational styles. A second video analysis study was conducted to understand these new interpretations of use and genre

²⁸ <http://news.bbc.co.uk/1/hi/7672149.stm>

analysis (Riemer and Filius, 2009) was used for this purpose. In order to do this each video was viewed in turn and a grounded approach was used to categorising them according to different genres. Each of these genres illustrate a distinct sense of relevance and purpose defined by Peter in relation to his use of YouTube. Table 15 below shows the repertoire of genres identified and the number of videos made by Peter within each genre over the entire period. Each genre is explored in more detail in the subsequent analysis.


Table 15: Different genres used in Peter's videos

Genre	Number of videos
Test videos	4
Reminiscence and life history	73
Reflections on modern life, news or world events	32
Promoting older people's involvement in modern culture	19
Personal reflections on everyday life and the experience of being 'old'	11
Advice or educational content	5
YouTube related	58
Filmed naturalistic events	3
Readings or scripted performances	21

Overall the development of genre by Peter occurred for a number of different reasons: it shows a development in his skill at video making; changes in the equipment he was able to access and use as a video maker; his growing popularity on YouTube generally; specific emerging relationships with other YouTubers; an increasing personal confidence and Peter's constant reinterpretations of YouTube's relevance and purpose within his life. Ultimately these changes allowed Peter to present himself to his YouTube audience in new ways. Each of these different genres will now be considered in turn, exploring their implications for Peter's ongoing appropriation of YouTube. Under the headings for each genre the details of an example video are given to illustrate typical aspects of that genre. It should be stated at this point that whilst Peter recognised that his video making had evolved during this period and he agreed that these genres existed, he had not started out with a preconceived notion of what the presentational style of these videos would be before making them. He suggested that the validity of these genres could only be in retrospect which would fit with the experimental 'active learning' approach that he took with computers and the Internet more broadly and in line with a sensemaking (e.g. Weick, 1995) perspective on appropriation.

Test Videos

Table 16: Details of example video for 'test video' genre

Example Video		
Information		Still taken from video
Title	Second Try	
Date Posted to YouTube	5 th August, 2006	
Description	Introductory Video	
Category	News and Politics	
Views	204,795	
URL	http://www.youtube.com/watch?v=Y3KrMBtpClk	

Test videos were very short videos of only a couple of minutes duration with little content. These were used by Peter as test messages to make sure that the video uploading procedures of YouTube were working as he expected. These were useful early on for Peter when he was still getting to grips with YouTube. He used them to make sure that videos he had uploaded actually appeared on YouTube and that other people could find them. As figure 17 shows they disappeared quite quickly once he became more confident with using YouTube.

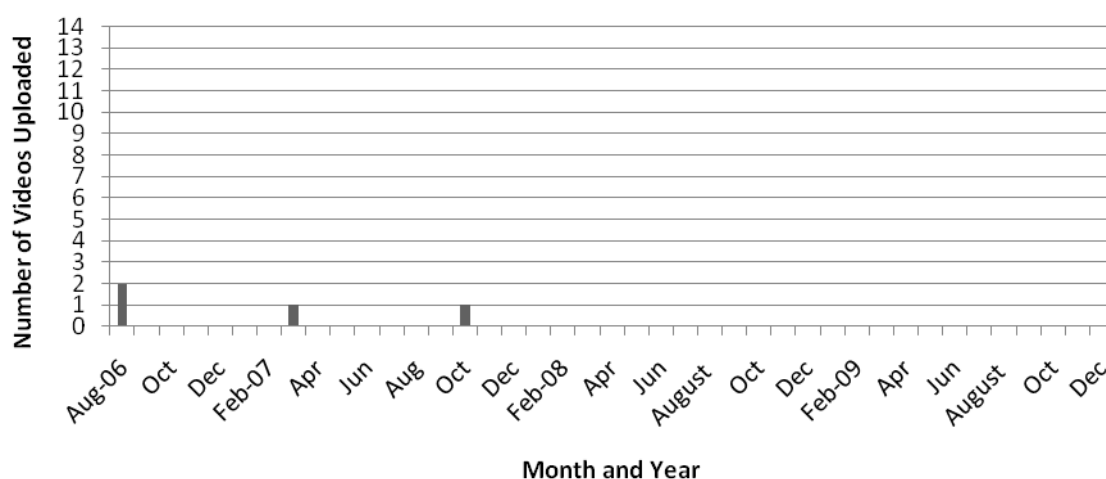


Figure 17: Test videos over time

Reminiscence and Life History

Table 17: Details of example video for 'reminiscence and life history' genre

Example Video		
Information		Still taken from video
Title	Telling it all 24	
Date Posted to YouTube	3 rd October, 2006	
Description	More tales of childhood	
Category	People and Blogs	
Views	23,085	
URL	http://www.youtube.com/watch?v=S1FleiDK-TU	

Reminiscence and life history framed Peter's initial use of YouTube and remained a significant element in defining his YouTube engagement for the first eighteen months. As seen in the earlier analysis it provided Peter with an important role early on which he described in interview as "*the internet granddad*" or telling "*a granddad story*". These videos were each around 10 minutes in duration and recounted tales from Peter's life. He started by working through his life in a chronological order recounting significant events in his life. By November 2006 his reminiscences were up to the present day and he started to revisit specific events from his past in order to elaborate more fully on particular aspects of his past either in response to viewer requests or through his own introspection. These videos also developed opening and closing sections in which Peter would give an update of what had been going on in his life and what was about to occur particularly in relation to his growing notoriety on YouTube and in the media. This added a sense of currency to these videos irrespective of the time that he was reminiscing about.

The perception of Peter through these videos as a kind and trustworthy 'Internet granddad' meant that some of his younger viewers started to confide in him with their own (often difficult) life situations sending him personal messages through the YouTube messaging system. Peter read out some of the 'letters' he received in a video from March 2007,

I am suffering from depression for 4 years and recently was seriously considering committing suicide. Yeah I know how foolish it sounds. I was at YouTube basically to watch only violence videos to train myself to get rid of the fear of death. Then I accidentally saw your video and watched a couple more. I started to cry watching your video made me think about myself, my life, my

current struggle and the stupid idea of killing myself. I want to let you know the inspiration you are spreading through YouTube. (Peter - video ²⁹)

Dealing with these messages was emotionally challenging for Peter with him often becoming tearful whilst reading them on video. He took such messages very seriously and wanted to respond to them all. Whilst this created a new role for Peter as an informal counsellor it also started to take up a lot of his time. As he explained in an interview in August 2007,

I have got over 4,500 letters [messages from YouTube] in there somewhere and a lot of them I will never get access to because they came in the first rush. I am able to handle the number that I get now but it is sometimes, I mean sometimes I get up at 6 o'clock in the morning to start them and I don't go on all day, I have a few breaks but I mean it can be an all day job. (Peter – video 64)

Once his correspondence was completed he would make himself available online. He also started to signal his ongoing commitment and availability in his YouTube videos by rounding them off with information about the next video.

I will come back and tell you more but until I do, be nice to each other, take care, goodbye (Peter – video 16 ³⁰)

As figure 18 shows Peter's life history videos appeared less with time and had virtually disappeared within 18 months of him starting on YouTube although brief reminiscences still form parts of his other videos. In interview with Peter in January 2010 he explained that he had become concerned after about 18 months on YouTube that his viewing figures were going down and he was receiving less 'letters' from his viewers. He decided to change his video format around this time hoping that his videos would be more interesting and so that more of his viewers would keep watching. As he explained in the interview,

No, I don't get as many letters as I used to. My viewing figures are sort of going down and down and down. I am not as popular as I used to be (Peter)

²⁹ Telling it all 45 4th March 2007 http://www.youtube.com/watch?v=z_wyfmeyOC0

³⁰ Telling it all 13, 30th August, 2006. Available at:
<http://www.youtube.com/watch?v=c8kqYn1B7VQ>

Far from being concerned about his own personal fame however Peter was keen to maintain the interest in his channel so that he could continue to support and promote the good causes that he had become involved with through his YouTube notoriety.

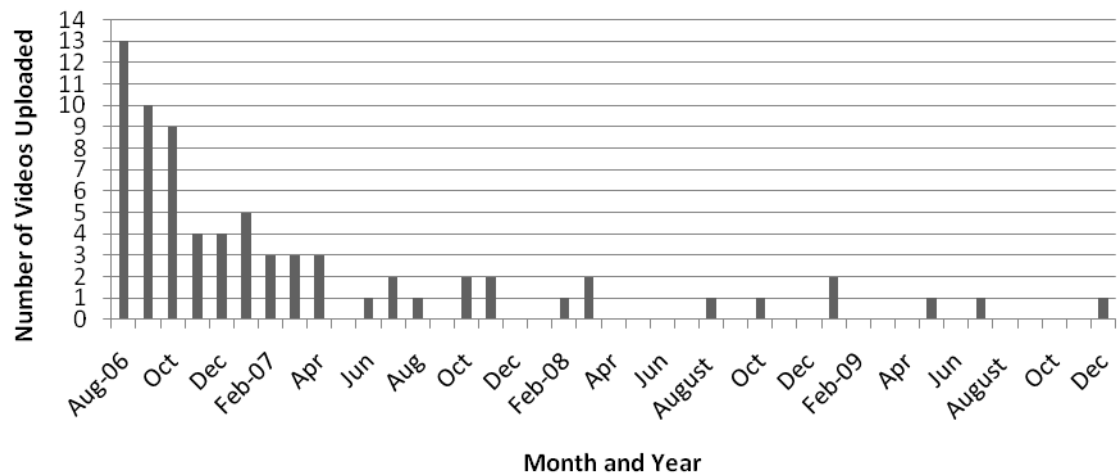


Figure 18: Reminiscence and life history videos over time

Reflections on Modern Life

Table 18: Details of example video for 'reflections on modern life' genre

Example Video		
Information		Still taken from video
Title	Geriatric Thoughts 5	
Date Posted to YouTube	12 th March, 2008	
Description	Recycling or disposing of computers. Identity fraud and the dangers.	
Category	People and Blogs	
Views	4,955	
URL	http://www.youtube.com/watch?v=zL1zeEuhYRA	

Reflections on modern life are short videos of less than 5 minutes where Peter presents current news stories or events and gives his reaction to them. Occasional videos of this ilk appeared from the start but they became more prolific when his life history videos started to tail off and his video making was generally at a low ebb around January 2008. At this time he felt that he needed to have a shorter more dynamic format to maintain his viewers' attention. As he explained in interview January 2010,

There is always the stage where nobody is going to listen to your comments if they go on for more than three minutes and all the popular people use sort of a sexy icon or a sexy title because they are looking for views all the time.....I think that when I thought 'oh I'm getting fed up with this I'll follow everybody

else's example I'll just do a one minute video thought for the day' and so that was my thinking (Peter)

These videos continue to play on the perception of him (by some of his younger viewers) as the 'Internet Grandad' and start with a short introductory sequence in which a young boy asks, "*what's on your mind today granddad?*" and are titled "Geriatric Thought for the Day" or "Geriatric Thoughts" with a sequential number attached to indicate their order. They also reflect a very early intention of Peter's (present in his second video) to blog about news items that had grabbed his attention and to give his own point of view on these items. In these videos he considers numerous topics including actors' being poor performers at recent BAFTA and Oscar award ceremonies; loud audiences at music concerts drowning out the band; professional footballers who seem to need childlike adoration; the brainwashing effect of advertisements; the dangers involved in recycling computers in lieu of identity fraud; egocentric DJs talking over the music on radio stations; the stupidity of a government think tank that have stated quite obviously in Peter's opinion that children learn better on a one to one basis; etc..

Many of these videos are also overlaid by a young voice saying "*Grandad, I think you're becoming a grumpy old man*". Whilst he perpetuates a view of himself here as being at odds with the modern world and struggling to appreciate modern ways of doing things he is at the same time accommodating the attention span of a younger audience and their modern expectations.

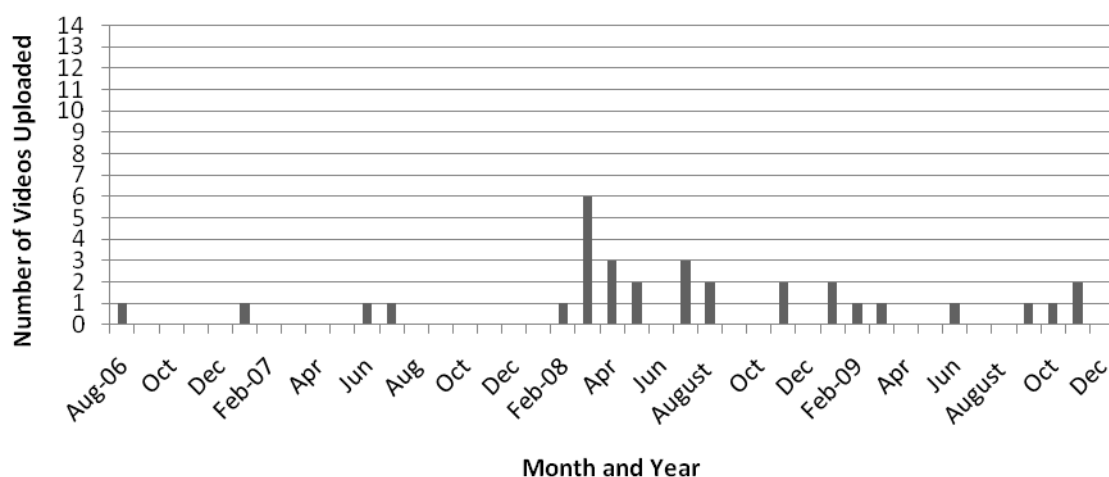



Figure 19: 'Reflections on modern life' videos over time

Promoting Older People's Involvement in Modern Culture

Table 19: Details of example video for 'promoting older people's involvement' genre

Example Video		
Information		Still taken from video
Title	Help for the Elderly – part 2	
Date Posted to YouTube	23 rd January, 2008	
Description	Further discussion about the elderly and their involvement with computers and the Internet. Youtube and it's role in intergenerational communication. Forgot to mention that the paper that I refer to can be seen on my website if anyone should be interested to read in full. http://www.askgeriatric.com	
Category	People and Blogs	
Views	6,822	
URL	http://www.youtube.com/watch?v=O6WcOX4B6Ds	

Videos promoting older people's involvement in modern culture are of varying length and show Peter giving 'air time' to causes of interest to him, particularly those relating to older people. These videos came about as a result of Peter's YouTube fame with a number of organisations asking him to be involved in charitable or awareness-raising events as a role model for older people wanting to engage in modern culture. The most significant of these in Peter's videos was his involvement with the Zimmers band mentioned earlier. He documents this with videos made on location with the band and through direct promotion of their songs. He also signposts initiatives aimed at promoting computer and Internet use by the older generation working with individuals and groups such as Age Concern to encourage more older people to get online. He takes this role very seriously and makes a point of having a shirt and tie on when speaking about these issues in his videos rather than the more casual clothes that he normally wears. In some of these videos he interviews older people to illustrate to other YouTubers (particularly the younger ones) the kinds of issues that older people face with regards to computers and the Internet.

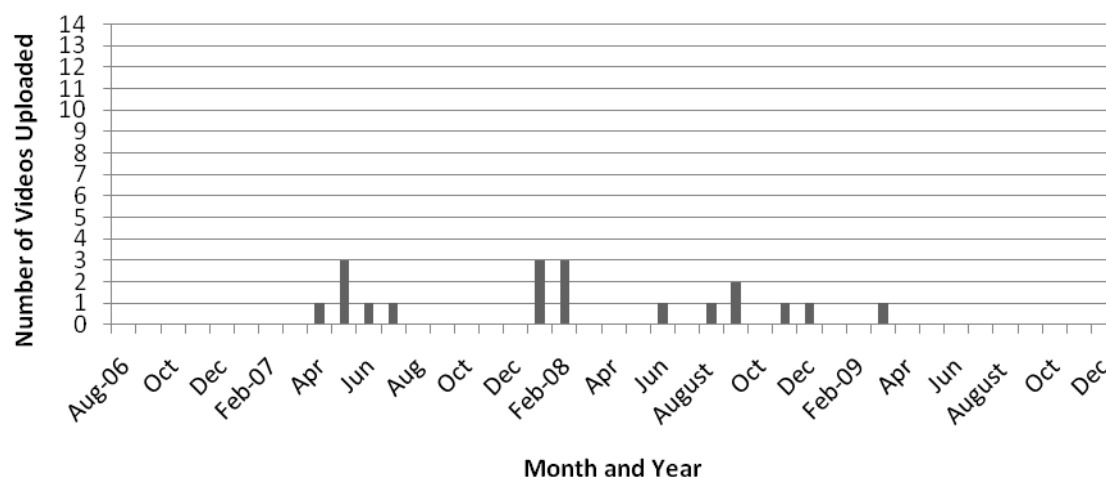



Figure 20: 'Promoting older people's involvement' videos over time

Personal Reflections on Everyday Life and the Experience of Being 'Old'

Table 20: Details of example video for 'personal reflections on everyday life' genre

Example Video		
Information		Still taken from video
Title	Life in my 80 th Year	
Date Posted to YouTube	13 th February 2007	
Description	Answering some questions about my present day life	
Category	People and Blogs	
Views	44,020	
URL	http://www.youtube.com/watch?v=-E0lRx96Uw8	

Personal reflections on everyday life videos are occasional and unscripted videos of varying length which show Peter talking freely about the concerns he has in his daily life. He does not dress up for these videos but shows himself 'as is'. In these instances he uses YouTube as a witness to his life, capturing the personal frustrations of his everyday life and his experience of growing older in a changing world. In one video Peter talks about the monotonous experience of doing everyday household chores (in this case the ironing) and his joy at being able to escape such boring routines by getting away from home. Alongside this he ponders the seemingly contradictory joy of returning home after trips away with the Zimmers band and being so pleased to be back amongst the familiar, sinking into his favourite chair. In another video Peter talks about having to give up his beloved car because he can no longer get himself out of the door due to his arthritis. He likens this to taking a beloved pet to the vets to be put down.

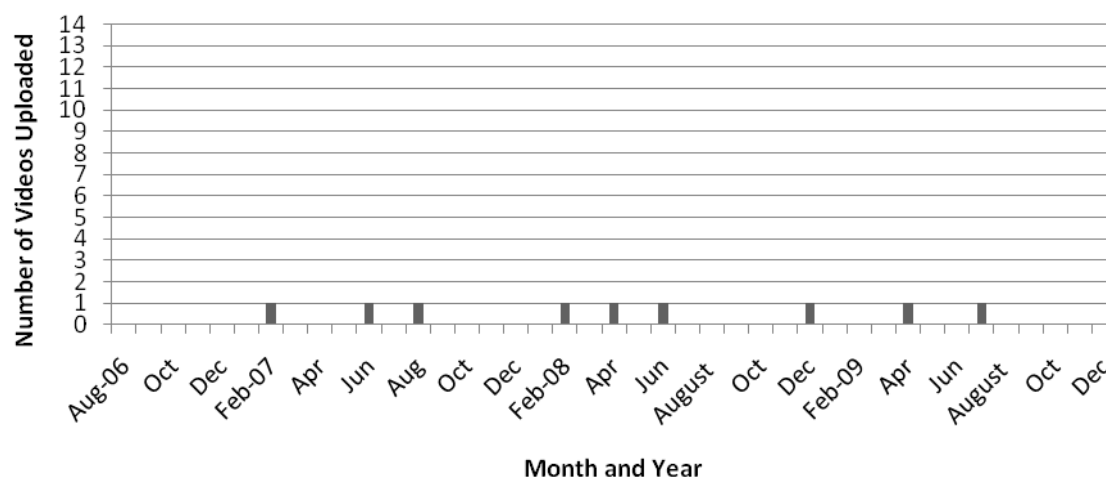



Figure 21: 'Personal reflections on everyday life' videos over time

Advice or Educational Content

Table 21: Details of example video for 'advice or educational content' genre

Example Video		
Information		Still taken from video
Title	My Biker Grandson	
Date Posted to YouTube	15 th September 2008	
Description	We look at his latest bike and discuss a few things	
Category	Cars and Vehicles	
Views	11,013	
URL	http://www.youtube.com/watch?v=rpUzTppyqOk	

Advice or educational videos contain the passing on of practical knowledge related to motorcycle maintenance. Throughout Peter's videos he is careful not to give advice especially to younger viewers. The only videos in which he expresses his own personal expertise on a subject are those involving his grandson and his motorcycle. In these five videos Peter films his grandson's motorcycle at different stages of deconstruction, pointing out important elements of its design and construction and informally instructing his grandson by reiterating information that he knows they already share. This provides new information to YouTube viewers and allows Peter to include his grandson in his YouTube endeavour. Interestingly his grandson (as well as the rest of his family) have no interest in his YouTube life and never actually appear in his videos if they can help it only occasionally appearing in the background.

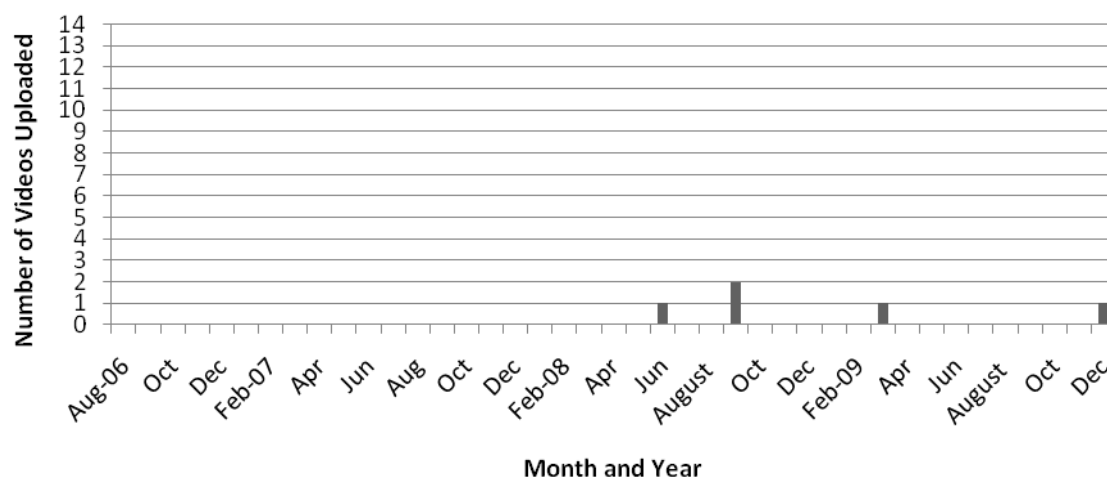



Figure 22: 'Advice or educational content' videos

Filmed Naturalistic Events

Table 22: Details of example video for 'filmed naturalistic events' genre

Example Video		
Information		Still taken from video
Title	[CC] Fox Hunting	 <p>(Peter) GOOD MORNING. (Both riders) GOOD MORNING.</p>
Date Posted to YouTube	26 th December 2008	
Description	The local hunt pass my home on Boxing Day	
Category	Pets and Animals	
Views	31,794	
URL	http://www.youtube.com/watch?v=1s5FoXkt2qI	

Peter's videos of naturalistic events are made with a portable video camera filming events outside of his home. In January 2008 Peter was visited by the producer of an American TV programme³¹ who left him with a portable video camera which he has experimented with in subsequent videos. Peter uses this camera very rarely because of the restricted mobility caused by his arthritis. If he wants to go long distances he has to rely on friends, public transport or his mobility scooter. Despite this he has made videos as a passenger in a farming friend's Landrover driving across farm land; filmed a fox hunt going past the end of his driveway and some children doing BMX tricks in a nearby yard. In these videos he is no longer the subject of the video but focuses on events that interest him in his immediate surroundings.

³¹ Shooting the breeze with Mo, 1st January 2008 <http://www.youtube.com/watch?v=ArwQejKLGiM>

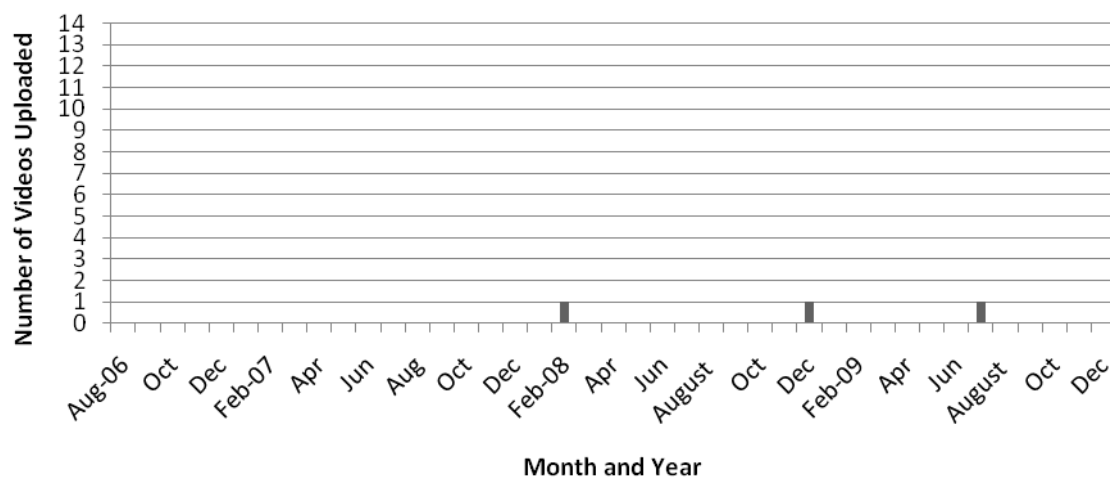



Figure 23: Videos of naturalistic events

Readings or Scripted Performances

Table 23: Details of example video for 'readings or scripted performance' genre

Example Video		
Information		Still taken from video
Title	All the way through - part 6 Final chapter	
Date Posted to YouTube	23 rd December 2009	
Description	Thelma gets her own room and pacifies Charlie. Wonder what will happen in the future? Will she meet Richard? I guess that I will have to write a sequel	
Category	People and Blogs	
Views	441	
URL	http://www.youtube.com/watch?v=xRSKXYcBBAY	

Videos of readings or scripted performances are long videos of up to 10 minutes which have been prewritten with Peter reading from a book, singing a song or acting out a performance. In discussion with Peter it became clear that he had started to struggle to come up with sufficient content for making regular videos. He had started to experiment with prewritten materials that he would read out, sing or act out. Reading out a book he had written as a Xmas story; singing a song from the Zimmers album or acting out a scene that he had dreamed up beforehand and scripted out.

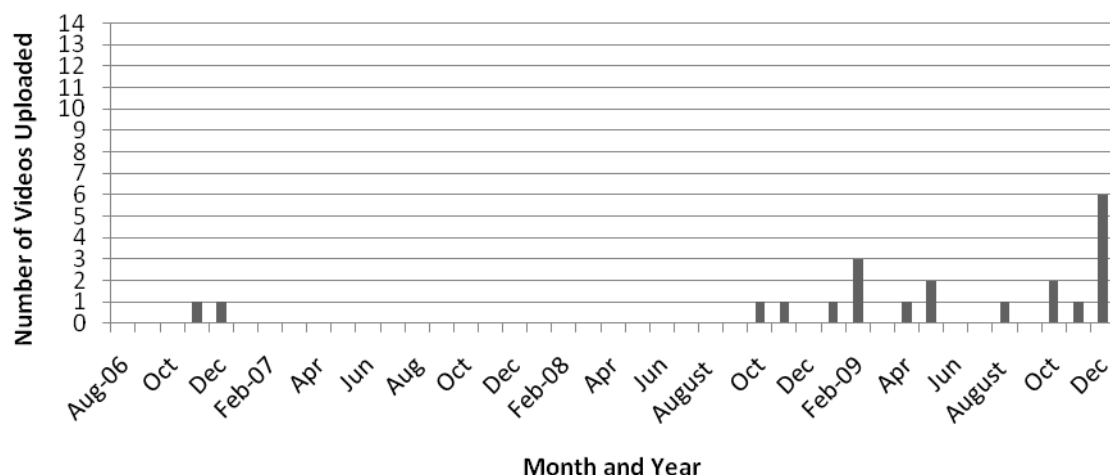



Figure 24: 'Scripted performance' videos

YouTube-Related

Table 24: Details of example video for 'YouTube related' genre

Example Video		
Information		Still taken from video
Title	TEENAGERS AND DRUGS	
Date Posted to YouTube	7 th September 2007	
Description	A response to a question posed by a teenager for publication in his school newspaper	
Category	People and Blogs	
Views	34,828	
URL	http://www.youtube.com/watch?v=aIHW0gO41aI	

YouTube related videos are made in a video blog style and show Peter discussing events relating to the YouTube community. These videos show Peter participating in YouTube as a living community and were present from the start. He may be responding to other YouTubers' videos, discussing YouTube related events, keeping others informed of his own activities relevant to the YouTube community or discussing issues publicly with other YouTubers. Here Peter also documents visits from TV crews, invitations to attend meetings and personal visits from other YouTubers. Whilst these videos were present from the beginning they were most often embedded within his life history videos as the opening and closing sections. They emerge more as distinct videos once Peter's emphasis on life history reduces around April 2008. As figure 25 shows these kinds of videos have become a more significant element of Peter's ongoing appropriation of YouTube as time has gone by.

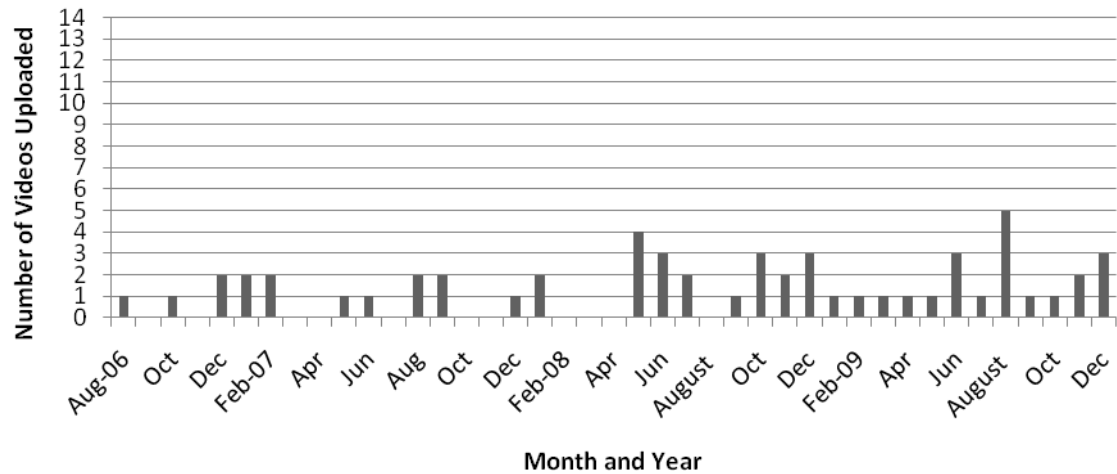


Figure 25: 'YouTube-related' videos

One characteristic of these videos is their conversational style: the sense you get when watching them that you are being invited by Peter to join in a conversation, i.e. to take part as a participant rather than just as a viewer. This is of course what makes YouTube a living community rather than just a collection of online videos. A closer look at one of these videos shows how the multimodal aspects of YouTube are used to create this conversational sense (for a more in depth analysis of this multimodal video dialogue and its implications for computer-mediated communication more broadly see Harley and Fitzpatrick, 2009).

Multimodal Interactional Analysis

Multimodal interactional analysis (Norris, 2004; Kress and Leeuwen, 2001) acknowledges the different ways in which meaning is conveyed and constructed in communication beyond the sole use of language. Examination of the video in this way therefore gives a fine grained, holistic account of interaction which incorporates not only language but also body posture, gestures, layout of filmed settings, the sound qualities of speech, editing of the video, etc; in fact anything that is used to convey meaning through YouTube's visual medium. A multimodal interactional analysis shows how Peter and his fellow vloggers through their actions, structure the awareness of their viewers by directing their attention towards particular aspects of the interaction and hence signify conversational intent.

In the example shown Peter is responding to a message sent to him through the YouTube message system. He sits facing his computer and addresses his camera. After initially greeting his YouTube audience he goes on to read out the message that he has received and printed out onto a piece of paper, as shown in excerpts 1 and 2. The transcription conventions are borrowed from conversation analysis (ten Have, 1999) and have been

adapted to incorporate other relevant actions. Along with accepted conventions³², the transcribed speech is annotated to show periods of camera eye contact in **bold**, and notes about observable actions in bracketed *italics*.

Excerpt 1:



Note: background objects highlighted

00:00:02 P: **Hello YouTubers** well first of all the title isn't er using the well tried and popular method of er getting views to **one's videos** by: a catchy title it comes from: erm a letter **from a young man** in Thailand who is a schoolboy=I believe he's aged fifteen but that's not relevant=he is the editor or producer of **a school** ↑newspaper and he has asked Geriatric if he will **answer** some questions to pose in his newspaper and I'm: reading his question (*picks up the piece of paper he has in front of him*)

Excerpt 2:



00:43:00

P: his question says teenagers more regularly have contact with drugs and alcohol despite **laws preventing this** do you believe that it is enty- sorry, (*starts to emphasise speech by waving his left hand up and down*) do you believe

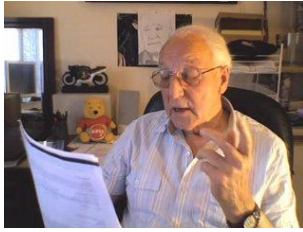


00:56:23

P: that it is entirely up to them to make their own choices

(*continues waving left hand up and down to emphasise speech*)

³² Speech conventions: (n) pause noted in seconds; = joining of words; : an extension of the preceding syllable; ↑↓ rising or falling intonation for subsequent utterance; underlined text indicates spoken with particular vocal energy; - a sudden cut off to an utterance; ? a rising tone; . a falling tone; , a shifting continuous tone bridging utterances



01:01:43

P: or should their parents? have the final say, what would you advise to those that do enjoy experimenting with drugs (*stops emphasising speech with left hand*) and consuming alcohol at this age.



01:12:17

(*Peter puts the letter down, stops reading and starts responding to the question*)

Peter follows the letter reading by engaging in some brief discussion about the topic but then chooses not to give direct advice to teenagers. Instead he asks a number of his own questions which he has already prepared. In this short excerpt the conversational potential of YouTube becomes apparent, being exploited by Peter. He engages in a conversational 'turn' by responding to the initial question he had received and continues the conversation using his own questions. Later other YouTubers respond by engaging in a conversational turn with him. In all Peter received six video responses to this video and three of these were similarly conversational. This is a typical scenario for these kinds of videos. Such vlogging 'conversations' appear similar to face to face conversations in that they have the same openings and closings (Tang, 2007) as well as overt turn taking and the sharing of personal perspectives. However, the constraints of the medium mean that Peter and his fellow YouTubers must invent conversational 'work-arounds' to maintain the sense of being in a conversation whilst only interacting with a camera. They do this by reenacting aspects of face to face communication to make their interactions seem *real* in front of the camera. Peter uses eye contact, body posture, gestures, physical props (his printed email message) and silences during speech to recreate turn-taking expectations and ongoing engagement with his audience. The YouTubers that respond to him also recreate the sense of turntaking in their own idiosyncratic ways: a) re-playing segments of Peter's original video, listening to each question then responding in turn; b) typing Peter's questions out onto the computer screen and then referring to them one by one and c) by internally engaging in turntaking through the use of self-rhetorical questions that relate to Peter's questions.

Perhaps not so obvious at first glance is the fact that Peter is also simultaneously engaging in inter-personal communication whilst communicating with a larger (mostly anonymous)

YouTube audience. He does this by using objects placed in the background to explicitly but indirectly communicate with particular individuals at the same time as engaging in a spoken dialogue with the rest of the YouTube audience. YouTube viewers have sent him a drawn portrait and a teddy bear (see excerpt 1) and by placing these objects in the field of view he is able to show the senders his appreciation of them, identifying them as cherished objects in his home, but without needing to explicitly draw attention to them³³. Similarly the message in printed form (which Peter refers to as a letter) is used by Peter to reinforce his personal consideration of its content whilst simultaneously communicating in a public arena. It is through this use of 'background' and 'foreground' elements Peter is able to address different audiences simultaneously.

In terms of appropriation these conversational subtleties are an important aspect of realising the social potential of YouTube and of creating the sense of intimacy intrinsic to an older person's communicative needs (e.g. Carstensen, 1992). It seems that Peter was not initially aware of their ramifications in relation to his own video making, having to first recognise their significance. In an earlier video (video 17, 1st September 2006 ³⁴) he stressed the importance of interacting with the camera and explains how he had learnt this from another vlogger,

I've been told that I need to look at the camera by somebody, which I can never do, but I will look at the camera [Peter holds his glasses to emphasise his effort to look at the camera] and say goodbye (Peter)

Discussion

Following Peter's appropriation of computers and the Internet from adoption to deep engagement the context itself can be seen transforming from one defined by solitary use and occasional support from family and friends to one fully immersed in an online social context where learning is part of communication and self presentation. The availability of this online social context seems to have been pivotal in promoting Peter's further appropriation.

During the first video analysis four core themes were identified which made Peter's early use of YouTube relevant and meaningful to him: social contact; reminiscence/life review; intergenerational connection and creativity. Other themes shown to be relevant in

Identified in interview with Peter

³⁴ Telling it all 14 (part 1) <http://www.youtube.com/watch?v=zq6fEtEE5vE>

previous studies (those of maintaining independence and accessing information) were absent from both these analyses. This was probably due to the exclusive focus on the YouTube context as a basis for analysis rather than reflecting any non-use by Peter with respect to these purposes. During the second video analysis reminiscence/life review dropped away as a core theme but the other three themes remained significant in framing Peter's ongoing appropriation of YouTube. Social contact, intergenerational connection and creativity were all implicit in the genres used by Peter in the second analysis. The genres themselves defined relevance and purpose in social terms rather than technological ones, i.e. they provided socially agreed templates for communicating meaning between YouTubers rather than dictating technical formats or processes. Peter's implicit awareness of genre and his ability to engage with YouTube at this level implied that his learning had shifted emphasis from one foregrounding the use of technology to one where technology was in the background.

The different genres added a personally transformative potential to Peter's use of YouTube in terms of his own self presentation and opportunities for personally meaningful communication with others. In this second video analysis Peter moved beyond a fairly fixed identity using life history as a vehicle for relating to others and explored new identities in relation to his YouTube audience. This was seen indirectly through the genre analysis and directly from interviews with him. YouTube has provided Peter with opportunities to explore and play with identities that go beyond that defined and constrained by his current life situation. The life review element of his early YouTube involvement was perhaps the archetypal form of self-reflection associated with advanced age (Erikson, 1959; Butler, 1963) and was an obvious place for him to start with his own search for meaningful use of YouTube. For older people with reduced mobility reflecting on one's life in this way is often the only pragmatic way for them to integrate the different identities they have taken on during their life and to reconcile them with the immediate and perhaps contradictory experiences of their current living circumstances. Through YouTube Peter took a constructive route through his own life review (Freeman, 1997), moving beyond past identities based on his own memories of himself and starting to explore new identities in relation to others. This dynamic aspect of the ageing self has been described by some as the *social self* (Dittman-Kohli, 2005) and has been associated with positive adaptations to ageing.

The ability to integrate different identities into an ongoing coherent core sense of self is an important and healthy sign of ageing (Brandtstädter, 1998). Peter's ability to explore and integrate different identities through his use of genre in YouTube therefore provides him

with opportunities for dealing with deep existential questions about the nature of the self and its meaning in relation to other selves. In Peter's case this kind of contemplative activity appears to transcend limited notions of the self in the same way as described by the process of gerotranscendence (Tornstam, 2005).

The relational nature of YouTube means that Peter's experimental identities are not inert presentations but living invitations for others to communicate with him. These in turn have created new roles for Peter, some of these are apparent in his videos and some exist only 'behind the scenes'. His initial role was that of a storyteller. The intergenerational trust engendered by his early videos meant that younger YouTubers started to see him in terms of an elder or counsellor, confiding in him about their own life situations and asking for advice through direct and private messages. Later roles that emerged included online champion for older people, advisor, singer and comedian. These have all come with their own set of obligations and responsibilities which were not always enjoyable particularly at the beginning of his involvement. Despite this they provided Peter with meaningful engagement with the YouTube community and a feeling of inclusion. Although Peter initially took on board his role of 'Internet granddad' with some seriousness in time he also has developed a playful attitude towards his different YouTube roles, again showing a gerotranscendent attitude towards himself (Tornstam, 2005).

As with the first analysis Peter's social engagement was not focused on family relationships nor did it seem to express notions of socioemotional selectivity (Carstensen, 1992). Peter's family still take no interest in his YouTube videos at all, considering his involvement in it slightly immoral. His behaviour again appears more in line with gerotranscendence (Tornstam, 2005) with a shift in consciousness towards being open to the unknown in terms of creative expression and social encounters rather than selectively narrowing as Baltes and Carstensen might suggest.

Development of a Computer-Mediated Presence

Despite the growing media attention that Peter attracted through YouTube and the growing feelings of obligation and responsibility that he has felt towards his viewing audience it is the opportunities for intimate social contact that have remained an enduring highlight for Peter throughout. This is reflected in the videos that he makes which are directed at the YouTube community which have remained constant throughout his time on YouTube. YouTube has become a digital meeting place for Peter, his regular videos providing a conduit from where more personal communications can begin with greater degrees of private exchange and intimacy.

Vlogging is instrumental in creating a conversational context in which younger vloggers are invited to contribute. The visual medium of YouTube allowed Peter to express aspects of himself to others in a way that text-based media could not do. This focus on non-linguistic content shifts the emphasis in communication away from interacting with the technology (i.e. typing on a keyboard) and towards a social and embodied performance which relies on an implicit knowledge of human communicative behaviour. Peter had to learn some of the expectations of vlogging-style communication but this performative emphasis made use of his established social wisdom, something that older people are likely to already have (Baltes and Smith, 1990).

The earlier example of a YouTube 'conversation' shows one very public way in which Peter engages in conversations with others from YouTube. He also makes regular contact with YouTubers more directly and privately through email, YouTube messaging and Skype video calls. YouTube-initiated forms of communication have therefore transformed Peter's opportunities for social contact. Reflecting upon the impact of YouTube on his experience of home life Peter had the following to say,

Yes I think if you were to sort of close your eyes you are in a different world but I go back to the point I suppose of being a bit of a recluse and I don't mind being alone and whether if I didn't have the computer and my huggable internet friends I don't know how much I would then mind being alone. I can't really answer that question but I do come onto the computer in the morning and I will be here until lunch time and I will come back on again about tea time probably and it is my life now. (Peter)

Peter's development of an online YouTube presence means that the computer is now an ever-present source of social contact and companionship within his home. This means it is switched on for hours at a time and the computer itself has become a central focus in his home. He now has daily chats with friends he has made through YouTube via Skype video conferencing. Equally sitting down to make a new video for YouTube gives Peter a specific sense of belonging to the YouTube community,

I sort of know who I'm talking to, not individually but we are back to this homogenous huggable community for want of a better word and so if that means extra confidence then I suppose yes it does but it comes about because of that, you know. (Peter)

Peter describes his positive YouTube connections with great affection often using *love* as a way of explaining how he feels about them. Personal visits from other YouTubers are a highlight for Peter and still perceived as superior to any kind of online communication. He has had personal visits from YouTubers from America, Germany, China and England.

These communications by virtue of their intimacy are largely invisible from analysis here but are clearly the ultimate aim of Peter's engagement in YouTube. In terms of striving for emotional intimacy this fits well with socioemotional selectivity theory (Carstensen, 1992) except that Peter is exploring intimacy through new connections rather than existing ones. Peter's comments about YouTube as the 'huggable community' show his distinctions between self and other and corresponding feelings of aloneness versus togetherness dropping away leaving behind a transcendent feeling of love and communion which is not dependent on context but is integrated into his being even when not directly participating in the community. Once more this appears to be in line with gerotranscendence (Tornstam, 2005)

The Different Phases of Appropriation

This study reinforced and elaborated on the phases outlined in the previous studies but explored the shift from active learning to deep engagement in more detail. Figure 26 shows the revised model.

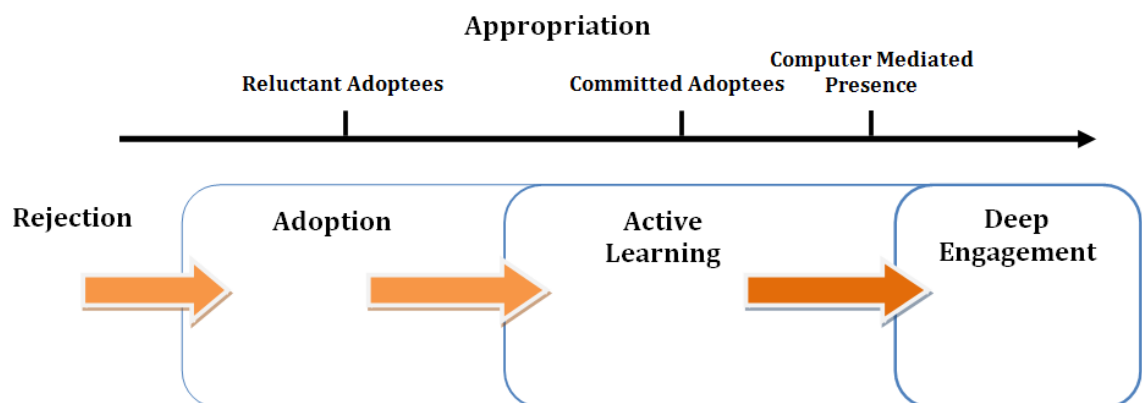


Figure 26: Appropriation Process Model from Peter's YouTube Study

Deep Engagement

With deep engagement comes a sense of *being* in a computer-mediated environment rather than *doing* computer-based activities with it being defined as a place rather than an activity. In this phase of appropriation the technology use is in the background and use is driven by psychosocial influence. Within Peter's YouTube channel this was indicated by

the regularity and volume of his video contributions. During the vlog itself his sense of having an online presence was shown by his willingness to treat communicative actions to and from other YouTubers as real and immediate even though they were in video form and enacted to a camera. YouTube at this point has become a place to meet and converse with others in a new and different way for Peter. As part of the establishment and maintenance of an online presence, Peter had to spend regular periods sat at the computer creating content and responding to his viewers. This has meant real changes in his daily routine and a consideration of the implications of YouTube events both online and offline. Whilst engaged in making vlogs Peter defines part of his physical living space as communicative space bringing the virtual into the real world. The embodied aspects of this space allow Peter to perform and share different aspects of his personality in a way that was unavailable to him before YouTube.

YouTube Culture

The participatory culture of YouTube which encourages the open sharing of personal viewpoints and dilemmas in a public arena is something which should not be underestimated in terms of its effect on Peter's appropriation of computers and the Internet. Without this it seems unlikely that he would have become so deeply engaged.

Summary

This two part study provided a detailed account of Peter Oakley's appropriation of computers and the Internet as a 'lead (older) user' of the YouTube website. Overall Peter's appropriation started with him defining a sense of relevance and purpose in relation to computers and the Internet which was not dissimilar to the previous studies based on family-oriented creativity. However his active learning process was radically transformed by his creative engagement with the YouTube community. This resulted in him developing his skills as a video maker and performer but also embedded his learning in a socially meaningful activity. His engagement was not driven by socioemotional selectivity (Carstensen, 1992) but showed an openness to new social contact (particularly with the younger generation). This along with the altruistic motives that permeated Peter's involvement with YouTube suggest gerotranscendence (Tornstam, 2005) as an explanation for his ongoing appropriation. Through his ongoing engagement with YouTube he developed the necessary technical, social and performative skills necessary to achieve a high degree of computer-mediated presence exploring new identities through the use of genre and becoming deeply engaged in the YouTube community.

In this chapter individual appropriation of computers and the Internet was considered from active learning through to deep engagement as part of participation in an online 'digital meeting place'. The next chapter looks at attempts to promote the complete appropriation cycle (from non-adoption through to deep engagement) using Nintendo Wii games consoles to create offline 'digital meeting places'.

Chapter 8 - The Nintendo Wii In Sheltered Housing

Covered in this chapter:

This chapter looks at appropriation of Nintendo Wii gaming consoles by older people living in sheltered housing schemes in Brighton and Hove, UK as part of a deliberate initiative to promote physical and social activity in these settings. In this setting daily living support was provided to varying degrees. Learning support during the Wii sessions was provided by paid and proficient charity support staff. The social context of use was shared with peers and carers within the home and social connections were not made available online. This was a longitudinal study tracing appropriation from adoption to active learning to deep engagement. This chapter is derived from a previously published conference paper (Harley, Fitzpatrick, Axelrod, White and McAllister, 2010).

Setting / Background

So far appropriation of computers and the Internet has been considered as an aspect of independent living using desktop computers and applications. In this study the appropriation of computer-based technologies is considered in the form of the Nintendo Wii games console and its use within a more dependent context shadowing an Age Concern initiative in Sheltered Housing schemes across Brighton and Hove in the South of England. Sheltered Housing is an approach to elderly care services in the UK where residents are encouraged to maintain their independence in rented accommodation but where certain support is provided on site when necessary. Different sheltered housing schemes have different levels of support available depending upon the abilities of their residents. Within sheltered housing a scheme manager or warden has responsibility for checking on the well-being of residents, liaising with health professionals and providing activities for residents to engage in to encourage activity and community engagement amongst residents. They are free to engage in such activities as they choose. Existing structures often include activity managers who organise a range of pursuits aimed at promoting health, well-being and social connection (Department for Communities and

Local Government, 2008) making them perfect places to explore the possibilities for such an initiative using the Wii.

The Nintendo Wii makes use of the PowerPC computer architecture which it shares with Macintosh and PC desktop computers³⁵. Wii interactions may be novel in terms of certain aspects of user engagement but at machine level the same symbolic functions are being applied and understanding the implications of digitised input are an important part of user appropriation. Initiatives aimed at encouraging older people's use of the Wii are therefore relevant to an understanding of computer and Internet appropriation more widely. The Wii is made distinct from desktop computers by presenting users with a restricted subset of all possible features and introducing wireless movement capture as the central control mechanism as opposed to a mouse and keyboard. The Wii uses a television style, channel based approach to presenting functionality and whilst it permits some Internet functionality through its news, weather, Internet and messaging channels, the game channel remains the default, running from game DVDs inserted into the built-in DVD drive. As the following study will show the game channel was the only one made available to players by the organizers from Age Concern. Wireless movement capture allows interactions with the game to take place in a physical space which is (relatively) independent of the console and display screen compared with that experienced with desktop computers. This has the important consequence of allowing social interaction to continue during use providing other social incentives for playing. Every player uses a 'Wiimote' which houses an infrared transmitter and built in accelerometers. Data from the Wiimote is communicated to the Wii console wirelessly via Bluetooth transmissions and a sensor bar and these are translated into corresponding virtual 3D movements onscreen in real time. The games themselves are designed to operate through overt physical movement, coordination and reaction to an onscreen virtual 3D space.

Nintendo have targeted the older generation as potential Wii players through specific advertising campaigns (Hall, 2006). News reports herald its popularity with older players in the USA (Wischnowsky, 2007), UK (Parker, 2007) and global sales indicate similar trends in other developed nations. Studies looking at older people's use of the Wii suggest that it may mitigate against cognitive decline (McLaughlin and Allaire, 2009) and provide an important source of social contact for them as a *computational meeting place* where they can engage with their peers and younger generations (Volda and Greenberg, 2009). Such social and therapeutic uses for the Wii build on a growing trend in games

³⁵ <http://en.wikipedia.org/wiki/PowerPC> [Accessed 20/5/2010]

development and deployment that enlist the fun elements of game play to encourage more serious aims (e.g. Griffiths, 2005). In this vein video games have already been used to support the physical, mental (Basak, Boot, Voss, and Kramer, 2008; Gamberini, Alcaniz, Barresi, Fabregat, Prontu and Seraglia, 2008) and socioemotional (Whitcomb, 1990; Goldstein, Cajko, Oosterbroek, Michielsen, Van Houten and Salverda, 1997; Gamberini et al., 2008) well-being of older adults. It was with these therapeutic aims in mind that Age Concern decided to make use of the Wii. Given the apparent success of this technology with the older generation it seems pertinent to ask how appropriation of the Wii takes place and how this contrasts with older people's experiences of appropriating desktop computers. The Age Concern initiative provided an opportunity to do just that.

Age Concern decided to introduce the Wii to older players by creating a Wii Bowling League across Brighton and Hove to 'open up the doors of sheltered housing' in the city and to provide an engaging and fun physical and social activity for older people to join in with. Age Concern were already encountered in chapter 6. They are a charitable organisation working in the UK for and with older people to promote their well-being (Age Concern, 2007). They normally have minimal direct involvement with sheltered housing and in the context of this study their role was very much in the form of outreach work, seeking to address the well-being of older people living there by promoting their independence through social and physical activity as part of structured community events across Brighton and Hove. The philosophy behind this approach, often described as 'Active Ageing' (WHO, 2002), is heavily influenced by activity theory³⁶ (see chapter 2, theories of ageing) which sees the well-being of older people as intrinsically linked to ongoing participation in social roles beyond retirement. It is embedded in government policies for older people across Europe (EC, 2005). In the UK active ageing is evident in government health and social care policies aimed at promoting health and well-being in old age by reducing the barriers to increased levels of physical and social activity (DoH, 2006).

Initial trials with some of Age Concern's existing membership at impromptu sessions at their headquarters suggested that the Wii was accessible to many of this age group making a bowling league a viable proposition. The league was set up in small districts around the city so that sheltered houses close to one another could play on a regular basis without their having to travel significant distances. The winners from these districts were then invited to compete in larger events staged at public venues around the city. This study follows the Age Concern initiative over the first year of its life both at regular sessions and

³⁶ Not to be confused with activity theory from Vygotsky's work in the 1920s and used in HCI.

public events looking at how the older players appropriated the Wii gameplay experience and incorporated it into their everyday lives.

Methods

Initially the Age Concern staff responsible for running the Wii sessions were interviewed to clarify the rationale for its use, to gain an understanding of their support role and of what motivated older people to join in. Each of these semi-structured interviews lasted an hour and took place at the Age Concern headquarters in Brighton. One interview was conducted at the beginning of the study (8th July, 2008) and another at the end (17th June, 2009). These were with different staff as the person responsible for the Wii initiative had changed during this time. Age Concern support staff were also accompanied to their weekly Wii sessions in the communal lounges of four sheltered houses and two 'Wii events' held in public venues across Brighton and Hove were observed. Sessions in the houses were deliberately chosen so that the progress of four different teams could be tracked in relation to appropriation of the Wii. One team were observed whilst they were being introduced to the Wii, another team that were observed had been playing regularly for 6 months whilst the final two teams were observed after they had been playing for a whole year and who shared regular weekly sessions. Over a period of 1 year, 10 sessions in Sheltered Housing settings were attended. Each session was about 2 hours long with a break in the middle for tea.

Overall 30 older players were encountered aged between 60 and 94. This group of older people tended to be non adoptees of desktop computers with only two of the players encountered also owning a computer. The number of older players per session ranged from 2 to 13 with one Age Concern staff member always present, one researcher and one Sheltered Housing scheme manager or staff member. Whilst the focus of the sessions was to engage older residents in the activity, others present were encouraged to join in and this allowed an element of participant observation to take place as part of the process. Notes were taken of participant observations and interviews were undertaken with the residents at appropriate intervals between games (recorded for later analysis). In line with an ethnographic approach, an effort was made to develop an ongoing rapport with the players and staff as part of documenting the Wii events. Three sessions were recorded on video but only once this rapport had been established (i.e. after two or three prior visits) and filming did not disrupt players' usual engagement with the Wii. These videos helped to capture the individual team playing scenarios and the evolution of game play within each context over time from initial use to six months to one year. These videos

were used as the principle form of data in relation to appropriation because of their temporal element. Analysis of these videos was conducted using multimodal interactional analysis (Norris, 2004). After watching all three of the video sessions in full, five minute segments were chosen to illustrate the differences in game play and the evolution of players' engagement with the Wii. These segments were also chosen because they portray similar characteristics in terms of the expectations of the game, all showing the Wii Sports bowling game. Using these three segments allows the comparison of multimodal constructions of meaning over different contexts and over time. Throughout the sessions players were observed playing a number of other games. The principle game and the one used to teach new players was the Wii Sports Bowling game, in particular a variant of the standard ten pin game called 'Power Throws'. Participants and organizers are identified throughout the paper by anonymised names.

Getting Started: Overview of Game Play Development

Game Choice: The Wii Sports Bowling game was chosen by the Age Concern organisers as an introductory game. From interviews with organisers it became apparent that older players were familiar with the bowling game concept likening it to lawn bowls or skittles and found the controls relatively easy to understand and operate. Figure 27 shows a screenshot from the 'Power Throws' version of the game which was often used for training new players or as a fun diversion from playing the standard ten pin version. In this version of the bowling game there are increasing numbers of pins to knock down at each throw and there are barriers on the side of the alley so that the bowling ball cannot go off the side.



Figure 27: Screenshot from the 'Power Throws' version of the Wii bowling game showing semi-transparent Mii character

Whilst relatively accessible there were initial problems experienced in relation to button controls with all versions of the bowling game. These related to the two buttons used during play, buttons A and B shown in figure 28 below.



Figure 28: Wiimote showing main buttons used during Wii bowling games

In order to start a new go players can briefly press button 'A' to return to the top of the bowling alley or wait for the game to return them there itself. In order to throw the ball down the alley button 'B' must be held down, a throwing movement made with the Wiimote and released at the right moment to send the ball down the bowling alley. There were problems with controlling both of these buttons. Button A was often held down for too long resulting in an error message appearing which blocked the whole screen until the button was pressed briefly again. This constantly interrupted play with new players and happened so many times that the Age Concern organizers resorted to covering up button A with a piece of stiff cardboard for new players. With button B the exact points in time needed for holding and releasing were difficult to master initially.

It's either they haven't seen it or felt it properly or that they haven't got the strength to do it...because the idea is that you don't touch anything on the top so it's not instinctive to hold that [the 'B' button] their hands just slide off the button (Pamela, Age Concern organiser)

The embodied movements needed to throw the virtual bowling ball appeared to be easily grasped. The difficulties experienced were with the relationship between the button pressing and these embodied movements. The bowling game was said to be good for new

players as it left control of game play progression down to the current player which was helpful in terms of structuring the bowling as a leisurely event allowing breaks in play at any point and not dictating the overall pace of play.

Competition: Only a minority of residents in any given home volunteered to participate in the Wii initiative. Indeed according to the Wii players communal activities in sheltered housing were generally not well attended. Age Concern recruited and trained teams from different sheltered houses and then got them to compete against one another as part of their league. The organisers saw team building and competition as important in engaging new players. At their public events two Wii consoles were set up side by side to give the impression of one team playing against another. In practice these early games were about learning how to play the game rather than competing with others. Competition with oneself in terms of one's physical and mental capacity was seen to be just as important as a motivation for the new players. As one player put it in justifying his own attendance and learning about the Wii,

if you don't use your head you lose it (Don, older Wii player)

According to the organisers men tended to respond more to the overall competitive element than the women with the men practicing deliberately on their own for public competitions.

Personal and Social Involvement: There were other reasons for joining in with the Wii initiative. Those with grandchildren were keen to keep up to date with them by learning about the Wii. They were aware that the Wii games console carried a lot of cultural capital with their grandchildren from family gatherings where it had been present. They were keen to share an appreciation of their grandchildren's enthusiasm and to develop sufficient ability to allow them to play together at a later date. The more immediate social aspects of game play with peers was also enjoyed and encouraged by Age Concern with deliberate time allotted to socializing between games and the use of tea breaks for this purpose.

Particular elements of the Wii were also harnessed by the organisers to encourage personal and social involvement during early game play. For instance the Wii uses on screen avatars called Mii's to represent individual players. These can be named and their appearance customized to suit each player. When introducing new players Age Concern support staff would encourage the players to spend a good deal of time choosing their Mii and giving it a name that they could relate to using '*nicknames they'd had as a child*'

(Pamela). Mii's were also used to promote a sense of group identity for competitions with a Mii being created specifically for the whole team and similar physical mascots being introduced to reinforce this group identity.

Personal commitment to regular Wii sessions as part of the Bowling League and public events was not inevitable as these new activities were seen as competing with already established routines particularly those concerned with shopping and medical appointments. During the summer months many players preferred to engage in activities outside of the home, visiting family and friends or going away on holiday. This meant that Wii tournaments were eventually defined by Age Concern as a winter activity.

Adoption: Comparing this scenario with the earlier studies of computer and Internet adoption it is clear that the initial impetus to engage with the Wii was similar to that at Age Concern's IT Drop-in Centre and for those in the Newhaven study in some respects. Like these previous studies it was embedded in a desire for social contact and intergenerational connection which provided a strong overarching sense of relevance and purpose which motivated learning and further appropriation. There was also evidence of new players challenging themselves physically and mentally through their use of the Wii as a way of maintaining their independence. Don expresses an almost identical stance to Jill in the Newhaven study with his comment, "if you don't use your head you lose it". Expressions of independence across the different studies differ in relation to context. For Sylvia in the Newhaven study and Barbara in the Age Concern study online shopping was seen as a way of maintaining independence in the community. For people like Don living in sheltered housing it was the ability to remain physically and mentally able that added to his feeling of independence. These different expressions of independence show computer or Wii use supporting adaptation to ageing in terms of selectivity with compensation for Barbara and Sylvia who were anticipating curtailed mobility in the future and in terms of selectivity with optimization for Don.

Playfulness, a willingness to engage in fun activities using the Wii, was also an important element in establishing early interest. Whilst this was not directly related to the overt creativity expressed in earlier studies (i.e. Sylvia in the Newhaven study and Peter on YouTube) it does appear to be an important precursor to creative activity particularly in relation to computer use (Webster and Martochio, 1992). Reminiscence and the sharing/accessing of information were not present as a direct result of engagement with the Wii but were present in the conversations surrounding it with players commenting on

their past experiences playing similar games and sharing information on topics unrelated to the Wii itself.

Playing on: Evolving Game Play

In order to understand the players' progress in terms of appropriating the Wii it was important to look at how they constructed the sense of meaningful engagement within the game play itself. Given the embodied and socially embedded nature of game play it was felt that this would be best done using a multimodal interactional analysis of game play which could capture the verbal and non-verbal constructions of meaning associated with evolving game play. Three separate Wii sessions at sheltered houses were analysed showing different stages of appropriation. Multimodal interactional analysis was used to explore the ways different communicative modes were enlisted to make playing the Wii a meaningful activity and how this changed over time. The different communicative modes that communicants used were identified and organised into broad categories. They were: use of the physical setting or layout (arrangement of the room, seating, furniture); manipulation of physical objects (arrangement or movement of objects in the space - plates of biscuits, cups of tea, the Wii controllers); body movement (postures, hand gestures, head movements, etc.); speech and vocal gestures (spoken language, intonation, reading from the screen and/or laughter) and other sounds (game music, noises and speech and/or noise from the surrounding environment). A table at the beginning of the description of each video summarises key characteristics and modes. Still frame images from the video are used to highlight the use of the different modes, along with the accompanying transcript. The transcription conventions³⁷ are borrowed from conversation analysis (ten Have, 1999) and have been adapted to incorporate the more extensive multimodal perspective (Norris, 2004).

Five minute segments of video from each filmed Wii session are used to illustrate the evolution of players' interactions across different sheltered housing contexts. These segments were chosen for their similarities in terms of game play as they all show the Wii Sports bowling game, allowing us to compare the multimodal construction of meaning over different contexts and over time. Each video captures use after a different time span:

³⁷ Speech conventions: (n) pause noted in seconds; = joining of words; : an extension of the preceding syllable; ↑↓ rising or falling intonation for subsequent utterance; underlined text indicates spoken with particular vocal energy; - a sudden cut off to an utterance; ? a rising tone; . a falling tone; , a shifting continuous tone bridging utterances

at initial use; use after six months and use after one year, and is representative of other video and observation notes of game play at a similar stage.

Video 1: Initial Use

Table 25: Information about Wii game playing session in Sheltered Home 1

No. Residents	35 (Sheltered Home 1)
No.Older Players	5
Previous experience of playing Wii	Novices. Dependent on Age Concern to provide console and screen. Need support to set up and play.
Number of consoles	1
Others present	5 (1 member of Sheltered Housing staff (briefly), 2 Age support workers, 2 researchers)
Games played in session	Wii Sports – Bowling; Wii Fit – Ski Jump
Modes used	Physical layout/setting – furniture, plates of biscuits, cups of tea, seating arrangements, TV screens; body movement - posture; gaze, reading of onscreen text; spoken language; laughter, silence

This first video is at a point of initial use. It shows an 83 year old resident becoming acquainted with the ‘increasing-pin’ version of the bowling game on the Wii. Out of the group of players she is the only resident in this home and from the start is designated the captain of the group. The other players are visiting from another Sheltered Housing scheme nearby and they all know one another. This is their second time playing the Wii and they are being instructed by a member of the Age Concern support team. Assistance is given when they encounter problems understanding game expectations or in using the Wii controller. This particular player has trouble working out when to press the ‘B’ button as also noted by the organisers and in previous studies (Neufeldt, 2009). Prior to playing the game, seating is arranged by the Age Concern staff in a semicircle around the game’s display. During play the whole team sit around the display and are intently focused on the game, giving encouragement and advice to the person playing.

Excerpt 3

Participants left to right: Dee-Age Concern, Edna-player, (off-screen: Ben-researcher), Beryl-player, Pat-player, Ann-player, Jan-player.



0.31.84

Dee: ok there's two↑ buttons to remember m'luv. frst press the button a↑

Edna: well it's not flashing.

Dee: no you're alright press b then-

Edna: press b?

Ann: press b and play↓ and play-

Dee: press butt'n b and put your ar:m: back and you're holdin;



0.41.92

Dee: (demonstrates throwing movement) n let go-

Edna: (successful throw) Dee: hey that's a good one↑

Ann: cor: that's a good one↓ Edna↑ hurray:, one left.

Dee: ha ha ↑

Beryl: Huhmm.

(9)



0.59.29

Edna: (swings her arm without effect)

In excerpt 3 Edna is trying to understand the action of button B in relation to throwing a ball down the alley and she starts off being quite impatient and irritated when the onscreen activity is not what she expects to see. In order to take her turn Button A must be pressed briefly to place the Mii character at the top of the alley (except the button has been covered with a piece of card by the Age Concern helper) and then button B must be pressed, held down whilst swinging the arm and then released to let go of the ball. Whilst the Age Concern helper (Dee) is able to demonstrate the embodied throwing action easily she cannot describe the points in time necessary for pressing and releasing button B. With this first throw Edna gets the timing right with corresponding encouragement from the other players. Edna's subsequent attempts are not so successful. She continues to press button B and enact the throwing movement without success. Her fellow players offer suggestions which are plainly wrong and do not help. In the end she keeps enacting the swinging motion repeatedly and pressing button B until it works.

The alternative to pressing button A to put the Mii at the top of the alley is to just wait until the game places the Mii there by itself. Edna takes a few multiple throws like the first one and then decides to just wait. In excerpt 4 Edna throws her fifth ball at which time a member of the Sheltered Housing staff enters the room.

Excerpt 4

Participants left to right: (off screen: Dee-Age Concern), Cath-housing staff, Edna-player, Ben-researcher, Beryl-player, Pat-player, Ann-player, Jan-player.



2.5.76 (member of Sheltered Housing staff enters at far door)

Cath: Hi=yah?

Jan: hello

Dee: yeah

(17)



3.04.44 Edna: (Does a double swing, the second one being successful. She knocks all the pins down)

Ann: very good

Jan: Oohoo:



3.12.40 (Everyone except Cath applauds)

Ann: Well done Edna, forty↑ five↑ pins↑

Dee: You see it dubbles up, when you get a strike you get dubble the points,

Pat: ninety↑ she's got there↑,

During this throw there is intense silent concentration amongst all the players as Edna waits for the appropriate time to throw the ball. All the players are paying attention to Edna's playing technique and taking note of them. The member of staff (Cath) interrupts the silence with her own greeting but is given minimal attention by everyone else as their attention is focussed on the game. With this throw Edna knocks down all the pins at once (a strike) with excited applause coming from all the other players and a big smile across her face. Cath does not join in the applause. The Age Concern demonstrator explains the scoring associated with a strike and player Pat reiterates this to the whole group as a way of confirming this new knowledge.

In excerpt 5 Cath, the member of staff, continues to start conversation ignoring the game play.

Excerpt 5



3.26.80 Cath: I thought they were doing skiing? or something?
today,
Beryl: we were↑ doin' that-
Cath: oh: you've done that have you? oh↓
Beryl: failures↑
Cath: h'h'h,



3.35.82 Edna: (Does a double throw)
Cath: where's ev'rybody from our house then coz there's only
Edna?
Beryl: go o:n:
Jan: ooh:
Ann: it's a lotta pins init↑ fifty four pins
(4)
Beryl: no, I d'know where↑ they=all↓ are↓
Cath: I've only popped in coz I'm busy, I can't stop. see ya later:

Despite the member of staff's attempts at initiating conversation with the players their attention remains focused on Edna and her playing of the game. Their responses to Cath are curt and do not invite extended conversation. Equally she makes it clear that she does not see their presence in the house as her responsibility, using a strange third person approach to talking to them as in "*I thought **they** were doing skiing or something today*". She quickly defines her responsibilities as concerned with residents only and therefore not this mixed group, retreating from the room to continue with other duties.

Even at this early stage there was the sense of an inner gaming circle (Juul, 2008) which emphasised the importance of the collective activity taking place with the Wii, creating a 'sacred space' (Goffman, 1959) around it. This seemed to be at odds with the day to day working practices of this sheltered home. Goffman (1959) talks about the ways in which people use conversation and body language to bound regions according to particular standards of behaviour or 'decorum'. In this setting consideration for the current player in terms of silence and appropriate encouragement were paramount as well as joint involvement in the ongoing game. The region of game play was bounded by the semicircle of chairs which created a physical obstacle to outsiders. The staff member was excluded from the gaming circle in order to maintain the correct decorum for playing the game. Here the creation of social meaning around the Wii begins, but at this early stage the mechanical aspects of the game play are foregrounded as the social focus.

Edna's approach here is reminiscent of the implicit learning approach taken by those at Age Concern when initially learning to use computers and the Internet with limited

understanding. Whilst momentarily hesitant and wanting to understand the consequences of her actions before starting, she quickly moved into an exploratory mode, using the experimental, trial and error approach described by Sylvia (in the Newhaven study) and Peter (in the YouTube study) in their accounts of successful computer learning. Again the repetition of actions through practice was central to Edna acquiring Wii literacy but the visibility of her actions to the others present meant that her individual learning was also immediately shared with them. This contextualised the learning process which meant that the memory problems encountered by those at Age Concern in learning the sequences of computer operations were not an issue here in the same way. Rather than having to resort to notebooks the Wii players had their collective memories to draw upon as a resource.

Video 2: After 6 months

Table 26: Information about Wii game playing session in Sheltered Home 2

Number of Residents	27 (Sheltered Home 2)
Number of Older Players	3
Previous Experience of playing Wii	Accomplished players with 6 months experience. Played in the final of the Wii Bowling competition at a public venue. Dependent on Age Concern to provide console and screen. Can set up and need no support to play.
Number of consoles	1
Others present	6 (2 other older residents, 2 members of Sheltered Housing staffs, 2 Age Concern support workers, 1 researcher)
Games Played in Session	Wii Sports – Bowling; Wii Fit – Ski Jump
Modes used	Physical layout/setting – furniture, plates of biscuits, cups of tea, seating arrangements, TV screens; body movement - posture; gaze, reading of onscreen text; spoken language; laughter, silence

Video 2 represents typical play after 6 months of Wii use. It shows an 81 year old lady (also designated as the captain) playing the standard ten-pin version of the bowling game. The players in this video are well acquainted with the Wii and have incorporated these sessions into their weekly routine. All the older players are residents of this particular home. The Age Concern support staff still give advice but are more focused on improving players' performances rather than teaching them how to play. They still provide support in setting up the Wii, accessing menus and configuration screens which allow game play to commence. The housing staff are also present and join in with the games. The current player has just returned from a period in hospital and has not played with the Wii for

some weeks. The other resident present has difficulty playing whilst standing up due to a stroke which has affected his stability. He joins in from his chair. The current player is fully conversant with the controls but has some trouble aiming her ball down the middle of the alley. The seating arrangements are not altered for the Wii and whilst those sitting around the game are supportive, their attention is not always focused on the game play with conversations about other topics taking place.

Excerpt 6

Participants left to right: Pedro-Age Concern, Mark-Age Concern, Irene-player, Julia-player, Pam-housing staff, (off screen: Pete-player, Liz-housing staff)

00.20.00

(14)

Pedro: Famous=strikes=please.

(16)



00.22.86

Irene: (pushes button with left hand to move across the alley)



00.29.90

Irene: (Throws the ball and knocks all the pins down)



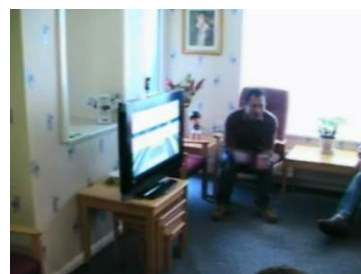
00.37.26

Pedro: (clapping) W:o ↑o↓

Irene: well I've 'ad one so's=I'm 'appy,

Julia: you'll get↑ more,

Pedro: that was the first one↑



There are no problems with button B here and the A button is not covered by the Age Concern staff during this session. Irene uses advanced techniques to play the game such as

moving her Mii character slightly to one side before throwing to compensate for her particular throwing style. Her control of the Mii at this point shows a degree of sophistication in terms of understanding what the Wii controller does and the way in which her physical actions will affect her performance. The Age Concern demonstrator (Pedro) recognises Irene's abilities from past sessions as indicated by his first comment "*Famous strikes please*" but wants her to continue playing her best and improving. Initially he does not instruct her directly but there is an obvious shared understanding between himself and Irene evident in both their comments.

In excerpt 7, different members of the audience (Liz and Pedro) are seen challenging Irene to recreate her best performances from the past. However the conversation surrounding the game starts to interfere with the silent shared concentration needed for playing. The conversation also starts to go off at tangents principally driven by the staff member Liz. Other members of the audience place their hands over their mouths to subtly indicate the need for silence whilst Irene is playing.

Excerpt 7

00.46.65

Liz: I want=you to show me how this turkey's³⁸=done Irene?

Irene: you must be joking 'Liz'↑

Liz: No↑o↓

Pedro: Dub'l↑ get↑ du↑b'l↓

Irene: (Pushes button with left hand to move across the alley, throws the ball)



01.17.49

Irene: (Pushes button with left hand to move across the alley - throws the ball)

Game: "nice↑ spare↑"

Pedro: second try now,
(15)



³⁸ A turkey in ten pin bowling is three strikes in a row

01.31.67

Irene: (Pushes button with left hand to move across the alley - throws the ball)

Liz: I didn't notice we've got a blue ball since we changed console, did we used to have a black ball or did we always have a blue ball?

Pete: can't remember ↓

Pedro: it changes- it changes- it depends-

Liz: maybe we'll always ↑ have this

Pedro: it was pink one before-

Irene: only one that time ↑



In excerpt 8 Pedro decides to give Irene some direct advice about how to correct her play seeing that her usual approach is not quite working. He recommends a subtle change to the positioning of her Mii character which Irene acknowledges and does. Unfortunately the conversation from the audience continues to interfere and becomes even more unrelated to the game. More of the audience start to cover their mouths with their hands as a way of reinforcing Liz's compliance in terms of being quiet and paying attention to the game.

Excerpt 8

Participants left to right: (off screen: Pedro-Age Concern), Mark-Age Concern, Irene-player, Julia-player, Pam-housing staff, (off screen: Pete-player, Liz-housing staff)

04.03.00 Pedro: you're going too much to your: right ↑,

Irene: yes I am aren't I ↓ I noticed that ↓

Pedro: if you go one less ↑ - you will get it right.



04.22.74 Irene: [pushes button to side - throws]

Game: "nice ↑ spare ↑"

Pete: Are they decorating the bedrooms?

C: No, it will be the entire common area and,

Pedro: try to be in the middle here Iren:e

Irene: in the middle there?

Pedro: right in the middle there (points to a place on the screen)

Liz: I'll ask for=the wallpaper book Sunday



00.04.50 Liz: the majority will be like the paper in the hallway,



In this setting similar standards of behaviour or decorum are established to those at Sheltered Home 1, i.e. consideration for the current player in terms of silence and appropriate encouragement as well as joint involvement during the game. In addition there is an expectation that players will challenge themselves and try to get the best scores. In this case the playing region is not bounded in space and instead is much more integrated into the existing spatial arrangement of the room. It is bounded in time as per the weekly routine so the players and audience are expected to abide by the decorum of Wii game play during these sessions. In this case the staff member Liz does challenge the decorum and cannot be physically excluded from the gaming circle but cues are given to her that she should maintain the correct decorum during the game. Here the Wii is becoming more integrated into social interaction more generally with the mechanics and usability aspects of game play starting to recede more into the background of play, enabling the social aspects to be more foregrounded.

This group of players could be considered committed adoptees in the same way as those in the Newhaven study. Like that group of computer users this group have established literacy with the Wii and an ongoing commitment to playing it by establishing game playing sessions as part of their individual weekly routines. They are also keen to learn more about the Wii in terms of how to improve their performance and what other games they can play. Irene has also started to develop her own sense of a *computer-mediated identity* with her established reputation amongst this group as a consistently good player of the Wii earned through her performances in the bowling league.

Video 3: After 1 Year

Table 27: Information about Wii game playing session in Sheltered Home 3

No. Residents	93 (Sheltered Home 3)
No. Older Players	13
Previous Experience of playing Wii	Accomplished players with 1 year's experience. Played in the final of the Wii Bowling competition at a public venue. Have their own console which they practice on regularly. Need no support to set up their own console and play.
Number of consoles	2 (Age Concern provide second console)
Others present	3 (1 member of Sheltered Housing staff from another home, 1 Age Concern support worker and 1 researcher)
Games Played in Session	Wii Sports – Bowling; Wii Play - Duck Hunt; Wii Sports – Golf; Wii Sports – Tennis
Modes used	Physical layout/setting – furniture, plates of biscuits, cups of tea, seating; body movement - posture; gaze, reading of onscreen text; spoken language; laughter

The third video shows game play after 1 year. Here an 82 year old man is playing the 'increasing-pin' version of the bowling game with three other players. One of the seated players (Sheila) is a newcomer to the Wii whilst the others are seasoned players. All of these players are resident of another sheltered home and have been invited to play by the residents (who are also present but not playing) at regular sessions every week for the last year. It is an established part of both houses' routines. This is a larger event than that shown in the preceding videos with 2 Wii consoles and 2 displays. This gives more of an atmosphere of an 'event'. The seating has been arranged in an extended semicircle around the displays and biscuits are placed out on tables adjacent to the seats before the visiting team arrives. This is all done by the residents of the sheltered home hosting the event rather than Age Concern and there are no housing staff present. The residents also greet people as they come in and make them cups of tea. Whilst people are playing the Wii they circulate amongst the players engaging in general conversation. Age Concern's input is minimal with these players now able to set up the Wii and access all relevant functionality using the menus and configuration screens confidently themselves. Two of the players present have bought their own Wii consoles which they use regularly on their own. Age Concern's role now focuses on keeping scores during games, keeping players focused on

the game and informing everyone of city-wide Wii events that they could take part in. Seasoned players are responsible for passing on their Wii skills to newcomers.

Excerpt 9 shows how the game play has become a background element to a larger socialising event. There are multiple conversations taking place throughout the room, sometimes focussing on the game but shifting easily to all sorts of other unrelated topics. The volume of conversation drowns out the noises from the Wii console. Dee (the Age Concern demonstrator) attempts to keep the focus on the game by pointing out the current state of affairs to others

Excerpt 9

Participants left to right: Peg-player, Sheila-player, Mary-player, Dee-Age Concern, Ron-player

0.24.52

Ron: (throws)

Mary: Oh nearly-

Sheila: the trouble with=me when I first started doin' it-

Mary: ev'rybody does that

Sheila: I kept lettin go=ov=it,



0.33.80

Sheila: (does action with the imaginary Wiimote in mid air)

Peg: yeah I keep doing that, goes off the line don't:it and I gotta go that way (does a jiggle with her shoulders)

Mary: then I move=over (points to playing area to show where) and then it starts going the right↑ way



0.50.68

Ron: (successful throw)

Mary: everybody does↑ that Sheila, you'll be alright

Sheila: do they? yeah, yeah, (picks up cup of tea and drinks)

Dee: dododado (waves hand up and down)

Mary: (picks up cup of tea and drinks)

Peg: oh it is hot in here isn't:it



1.09.59

Peg: (picks up tea and drinks)

Sheila: (puts tea down)

Mary: (puts tea down)

Sheila: oh, oh the supermarket down saint James's street,

Peg: oh isn't it hard?

Sheila: I know=I used to moan about it sometimes but I really miss it.

Dee: (picks up cup of tea and drinks)



Here Dee is largely redundant in her role with existing players teaching new arrivals. For newcomers acquiring literacy with the Wii in this setting, the learning takes place in a less overt manner to that seen in the other videos. It has become an aspect of communicating with one's peers, embedded in the process of getting to know one another. This contrasts with the situation in the other houses, who were at different points in the appropriation lifecycle, where learning was from a knowledgeable other (Age Concern demonstrator). The sense of decorum is also quite different with minimal consideration for the current player in terms of silence and encouragement. Expressions of joint involvement are still present but have shifted from an exclusive concentration on the game to sharing personal exchanges about their daily lives where a general atmosphere of gregariousness and open sharing supersedes concerns about the Wii. The playing region is bounded in space in the same way as in video 1 with one important change, it now encompasses two sets of players (one for each console). Interestingly although this recreates a competitive setting, competition itself is absent from the game play with each console set up for completely different games. Players treatment of the playing region as a 'sacred space' is less focused on the game with the providing of refreshments taking priority over game play. In this final example there is a foregrounding of social meaning around the Wii, where ownership now lies clearly with the residents and where the Wii merely provides the context/excuse for their interactions, and where the space has meaning beyond purely game play.

Most of the Wii players in this group could be said to be deeply engaged with the Wii in the same way as Peter in the YouTube study and Sylvia in the Newhaven study. Rather than the Wii being a focus of interaction for them it now provides a backdrop for self expression and social interaction within their group and beyond. Deep engagement with the Wii has provided players with new roles as instructors for new players and as hosts for existing ones. Alongside this deep engagement there has been an opening up to new experience and sources of social contact. Seasoned players have also become a new source of expertise within their own peer group.

Final Reflections from the Organisers

By the time of the final interview with the organisers over 100 people were playing in the Age Concern Bowling League most of whom would not normally be interested in new technologies at all (remember only two of those encountered during the study owned and used a desktop computer). The organisers believed that they had been successful because they were,

empowering people, supporting people, understanding people and changing this opinion of 'technology is not for me' (Pedro, Age Concern organiser)

In the videos this empowerment principle is seen playing itself out with residents taking more and more ownership of the Wii events with Age Concern support. Whilst some residents of Sheltered Housing are clearly unable to take part because they couldn't physically play the organisers felt that an inclusive approach was still important,

we want everyone to have a good laugh rather than all using the technology
(Pedro, Age Concern organiser)

It was also interesting to note that the competition element added an important emotional dimension to playing that was not evident in the videos of weekly game play,

"when they compete they get very competitive...their emotions and feelings are coming out through the competition, frustrations, they get stressed, they get anxious, they don't sleep. Then when they play they have a good time and all this stress disappears and they make new friends (Pedro, Age Concern organiser)

Discussion

The focus of this study has been on understanding older people's appropriation of the Wii in Sheltered Housing situations and contrasting this with appropriation of desktop computers as an aspect of independent living. Clearly Age Concern's role in this Wii initiative has been pivotal, expressing an underlying empowerment principle towards older players which has been significant in promoting independence, encouraging their independent mastery of technical literacies and a high degree of control over their living spaces. Here appropriation is seen not only in terms of relating the Wii's technical function to a sense of purpose but also in terms of appropriating the interactional space that is created by the Wii. This would be less of an issue for those living independently in their own homes but important here where ownership of communal space is contested between staff and residents, each defining different uses for that space. Similar contested communal space was evident online with the very negative responses received by Peter in relation to his video about expressions of intergenerational affection. Dorothy at the Age Concern IT Drop-in Centre was even challenged about her inappropriate use of email by her own son. Overall the appropriation examples in this thesis highlight the contested nature of computer-mediated interactional spaces and the need for older people to assert

their ownership of these spaces through ongoing participation. Age Concern along with the Wii players managed to do this by asserting their own sense of decorum within the communal space of Sheltered Housing through shared collective activity which empowered them to continue. This provided the players with new opportunities for learning about technology and for meeting new people that they would not have otherwise encountered. This transformed the social context by legitimising opportunities to share experience with others, initially through the shared experience of playing the Wii but later by incorporating other aspects of everyday life (such as grocery shopping experiences). In this way decorum defined expectations for appropriate social engagement and self expression in ways that were similar to Peter's use of genre in YouTube's online environment.

Creating a Sacred Space for Wii Game Play

As already mentioned the environment created by Age Concern and the Wii within Sheltered Housing provided opportunities to meet new people both within a particular home and beyond through competition with other homes. In addition it helped to redefine the physical and social spaces associated with Wii game play encouraging its successful appropriation. The physical movements which are a necessary part of playing the Wii helped to define the 'sacred space' (Goffman, 1959) around the game console with its own sense of decorum. Players had to step into this space in order to play the game and non-players were expected to be respectful of this space not entering it during play. This scenario played itself out in the same way across all three homes. Age Concern reinforced the sense of a sacred space with a chair circle around the Wii and defined decorum in conjunction with players as being based on fun and friendly competition with patient consideration for new players but an expectation that players would challenge themselves to the best of their abilities. Engaging with this space players first acquired technical literacy with the Wii but soon started to take ownership of this space and the social potential that it offered.

Taking Ownership of Communal and Social Space

Defining Wii game play areas as sacred space also encouraged the older residents in these sheltered houses to take *ownership* of those spaces whilst playing. In videos 1 and 2 it was Age Concern support staff who were responsible for appropriating space through the repositioning of chairs and tables along with the placing of the Wii console and display screen to form circles. In video 3 it was the residents who took full control of their physical space rearranging it without Age Concern support and inviting guests into that space. Here

the underlying social potential of the Wii starting to be realised. Previously, residents were largely reliant on the Housing staff to organize social activities and these were for residents only. Over time the sacred space of these events was also asserted in terms of time and social availability with the regular establishment of Wii sessions in the diaries of players. The Wii in these settings has been used as a pivotal facilitator in both shifting the power and motivation for social organization to the residents themselves and for widening the social participation to engage with other homes and with older residents in the neighbourhood, forging new social connections with peers that had not previously existed. Such active participation in residential settings has been acknowledged as important for the well-being of Sheltered Housing residents although it can sometimes be at odds with the concerns of housing staff who are focused on managing an efficient working environment (Abbott, Fisk and Forward, 2000). This appeared to be the case in Sheltered Home 1 in particular where ownership of space was contested.

Overall Wii game playing has allowed the older people in these homes to accomplish technical literacy with new technology, to express their own values in new and collective ways, expressing claims to ownership of communal space and time, defining new meeting places and providing opportunities for instigating new social connections with their peers. Together these contribute to the older people in these homes being able to frame what constitutes *meaningful use* of a technology for them.

The Different Phases of Appropriation

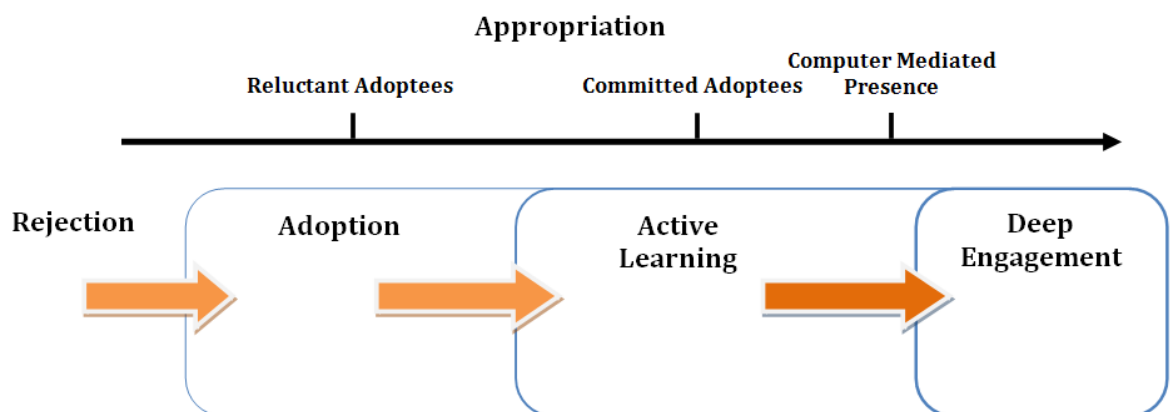


Figure 29: Appropriation Process Model from the Wii Study

Adoption

Few Sheltered Housing residents chose to attend the sessions overall but those that did were able to align their own sense of relevance and purpose with that defined by Age Concern. The way in which the purpose of the Wii and the space around it were negotiated

and defined by the players and support staff was integral to understanding its success. The framing of the Wii was predefined for users partly by Nintendo's design and partly by Age Concern who introduced the Wii as a device for playing offline video games and nothing else. Other functions available through the Wii console which relate more directly to computer and Internet uses such as web browsing, online news, weather and shopping channels, digital photography support were not presented or elaborated upon by the Age Concern support staff. Indeed the consoles were never attached to the Internet nor was the word 'computer' ever used in connection with the Wii. Preconceptions of use were therefore not a problem in the same way as for desktop computers as there was no connection made with work-based activities and using the Wii.

The players themselves related the Wii Bowling game to other games they had played in the past particularly lawn bowls. They defined the purpose of playing the Wii in terms of these past experiences but also to provide some social contact, intergenerational connection, as an aid to maintaining their own independence and as a playful activity. Social contact with other residents from other homes as well as their own home was also seen as an incentive for taking part and friendly competition was understood as an intrinsic part of playing a team game such as bowling. Some had heard of the Wii as a game playing device through their own grandchildren with the opportunity to play these games with them at a later date acting as another incentive for them to join in. Competing with themselves to maintain physical and mental abilities was seen as important as well as the opportunity to engage in a playful and fun activity.

Active Learning

Whilst few Wii players had ever used a computer, some of the same literacies were relevant to playing the Wii. For instance being able to map embodied movements to on screen movements with the Wiimote (with a computer this would be in two dimensions with the mouse and with the Wii in three dimensions with the Wiimote) and using buttons to interact symbolically with the Wii to input text and access menus in the same way as one would with a keyboard on a computer. The significant difference with computers was that the learning process for the Wii was embedded in the socially meaningful activity of the Age Concern Wii Bowling League rather than being based on an overt teaching model. Wii learning took place vicariously and collectively rather than through instruction.

Implicit Learning in a Social Space

The sacred space of the Wii provided a safe place to learn about the new embodied gesture-based interactions of the Wii. Learning was also supported by the physical nature

of game play. Individual interactions with the Wii amplified older players' physical abilities allowing them to take part in activities (such as bowling) which they would not normally entertain. The embodied interaction metaphor that translates physical off screen movements into enhanced on screen activities (making participation in such activities possible) was quickly understood and appreciated by new players. Age Concern staff demonstrated these capacities very simply through miming of the necessary actions (see video 1). The transparency of Wii interactions (and their associated difficulties) made them available to other players providing socially-embedded opportunities for vicarious and shared learning, with non-players observing and offering advice. Age Concern maintained an empowering approach to teaching the Wii interactions using a scaffolding approach (Bruner, 1986), reducing support as players' competence increased. Once basic literacies had been acquired the game receded as a focus of attention in its own right to become a context for other social purposes and where the skills were taken for granted.

Selectivity

In cases where Wii game play was associated with maintaining independence, selectivity with optimisation (Baltes and Baltes, 1990) was evident as part of appropriation. This was achieved in the same way as it had been at Age Concern's IT Drop-in Centre, through extensive practice. Socioemotional selectivity (Carstensen, 1992) was less evident in this study with the development of new friendships underpinning the success of the Wii initiative. It was also clear from the organisers that involvement in the Bowling League, particularly the public events, carried an emotional weight that was not characteristic of socioemotional selectivity with performance anxiety being a common reaction to these events. Despite these intense emotions it did not seem to deter players from ongoing participation.

Deep Engagement

The embodied aspects of Wii game play promoted the performative aspects of deeply engaged Wii players in the same way as the embodied aspects of vlogging promoted Peter's performative involvement in YouTube, i.e. the emphasis in both cases was on the social performance rather than interacting with the technology. This meant that Wii players were able to express themselves through new identities and roles as part of becoming competent Wii players. The most obvious of these in the third video were as hosts and instructors for other players but also as team captains and 'good' Wii players. Deeply engaged Wii players with the help of Age Concern established themselves as a new community of practice in a way not dissimilar to YouTube or Redbubble (except being an offline one) where the open sharing of technical knowledge and expertise was embedded

in social contact and participation in the collective activity of Wii game play. This open attitude towards others was not self-centred but spoke of an altruistic kind of sharing similar to that described by gerotranscendence (Tornstam, 2005)

Summary

This study considered appropriation of the Nintendo Wii games console in Sheltered Housing. There were differences to the previous studies of computer and Internet appropriation. The Wii initiative was a structured intervention influenced by particular philosophies on ageing perpetuated by the organizing bodies rather than being determined by the players themselves. In addition the Wii console, whilst ostensibly a computer-based technology, was presented in a different form and context to the user, operating through embodied interactions in a social space as part of game playing. Despite these differences there were commonalities in terms of relevance and benefits. Social contact, intergenerational connection, maintaining independence and playfulness (a precursor to creativity) all figured in discussions of relevance with the Wii players. The active learning phase was again subject to implicit learning (Reber, 1989) and selectivity with optimisation and compensation (Baltes and Baltes, 1990).

What also became clear in this study was the contested nature of these institutional settings and the way in which the Wii could empower older people living there to redefine these settings as community meeting places. Age Concern's involvement was pivotal in promoting further appropriation through defining decorum as a feature of Wii game play. This in turn empowered players to develop new social peer connections and a new community of practice around Wii playing that encouraged their ownership of the communal spaces in which they lived. At deep engagement new roles emerged for players as hosts of communal Wii events and as instructors to new players. The altruistic sharing amongst established Wii players was reminiscent of gerotranscendence (Tornstam, 2005).

Chapter 9 - Characterising Older People's Appropriation of Computers and the Internet as Positive Adaptations to Ageing

Covered in this chapter:

The studies shown in the previous chapters have explored older people's appropriation of computers and the Internet in different contexts and across various stages of the appropriation cycle in relation to individual abilities, motivations and circumstances. This chapter brings together the insights from these separate studies and develops the underlying concepts further. The six core themes that were shown to underpin appropriation throughout are discussed along with their significance in relation to adaptations to ageing. The implications of these themes are considered in relation to accessible design and an ecological view of access is developed to accommodate them.

The Lens of Appropriation

This thesis started by arguing that current notions of the older person present in accessibility measures were not adequate, only able to address the functional decline that occurred with ageing and to implement design changes at the interface in lieu of these 'deficits'. Accessible design as it stands is unable to accommodate the subjective, adaptive and 'positive' aspects of ageing that support older people's continuing development and which influence their potential use of computers and the Internet. In this thesis some of the deficits of ageing were encountered with many of the participants coping with failing eyesight, poor memories and the loss of friends and loved ones. However what also became clear was the significance of 'positive' adaptations to ageing in shaping older people's engagement with computers and Internet, allowing them to integrate these technologies into their lives as meaningful aspects of their broader ageing experience.

In this thesis appropriation was employed as an alternative theoretical lens and a qualitative, grounded and ethnographic approach was used to examine how older people

resolve issues of relevance, benefits and personal meaning in relation to their everyday use of computers and the Internet and as part of their broader adaptive experience of ageing. Previous research looking at older people's engagement with computers and the Internet highlighted the significant problems associated with older people not recognising the relevance (Selwyn et al., 2003; Dickinson and Hill, 2007; Richardson et al., 2005) and benefits (Sharit et al., 2004; Melenhorst et al., 2001; Melenhorst et al., 2006) of these technologies representing the biggest obstacles to increasing their adoption amongst this age group. An appropriation lens shows how perceptions of relevance and the realisation of benefits are actively negotiated by older people developing over time as adaptive responses to ageing potentially resulting in personally meaningful engagement. This moves us beyond current notions of accessibility and forces us to consider a broader *ecological* view of access.

The first research aim will now be accomplished by characterising older people's appropriation of computers and the Internet, showing how the relevance, benefits and personal meaning of these technologies are established as part of the everyday experience of ageing.

Establishing Relevance, Benefits and Personal Meaning

The appropriation of computers and the Internet undertaken by the older people in this thesis was clearly not part of a passive process of acceptance nor was it one defined solely by the deficits of ageing. It was an expression of these older people's ability to adapt to the demands of ageing through selective and innovative use of computer and Internet opportunities where judgments were continuously being made throughout. The meaning-making process that underpinned this appropriation involved an ongoing assessment of relevance, benefits to use and ultimately the establishment of personal meaning. The relevance and benefits of computers and the Internet was not something that was received as an immutable aspect of design but was established through an active process of exploration and discovery in relation to the pressing concerns of these older people's lives and in relation to the other people in their lives. Whilst this meaning-making process was an inherently individual endeavour there were six recurring themes which framed older people's use of computers and the Internet throughout providing motivation and an overarching sense of purpose to individual appropriations and across different contexts.

These core themes were:

- 1) Social Contact
- 2) Intergenerational Connection
- 3) Reminiscence and Life Review
- 4) Acquiring Knowledge
- 5) Maintaining Independence
- 6) Creativity

These represent broad notions of relevance in relation to the older computer users encountered in the studies. Previous research has identified the relevance of computers and the Internet to older people in terms of the applications that they have used showing email and Internet searches to be most popular (ONS, 2009; Jones and Fox, 2009). Viewing relevance through an appropriation lens gives us a deeper understanding of how such applications might relate to everyday life and the ageing experience. The implications of these different themes of relevance will be explored in more detail in a moment. First it is necessary to consider how it is that an apparent relevance is then transformed into activity which is perceived as beneficial and personally meaningful. According to Melenhorst (2002) older computer users engage in a cost-benefit analysis when considering committed computer use where costs are defined by the time and effort needed to learn new skills and the financial investment required to engage in ongoing use. Uncertainty in any of these variables can act as a deterrent but benefits play a decisive role. Melenhorst suggests that anything that is desirable and attainable can be considered as a benefit. In her thesis it was an improved feeling of emotional closeness with family and friends that was perceived as the decisive benefit for continued computer use. In this thesis similar benefits have been realised in relation to social contact but also very different ones in line with the other themes of relevance. The examination of appropriation in this thesis would suggest that the journey from identifying relevance to the realisation of benefits was not the result of a rational analysis as Melenhorst and adoption models (e.g. Rogers, 1995) might suggest but rather the result of an active learning process with computers and the Internet where learning was guided by an embodied, social and implicit interaction with the technology. Benefits were realised as a result of this learning and recognised on an emotional level rather than through rational decision making, i.e. they were not consciously recognised prior to use but only became apparent through use. In the Age Concern Drop-in Centre Ruth's example of receiving photographic email attachments from her son in China was typical of the emotional poignancy attached to occasions of realising benefits. Indeed Melenhorst's emphasis on

emotional closeness as a decisive benefit would suggest a similar socioemotional process being involved rather than the purely rational one she describes. This suggests a process more akin to sensemaking (e.g. Weick, 1995) which places emphasis on 'action as interpretation' rather than interpretation as a cognitive act.

Furthermore the identification of relevance and the realisation of benefits for the user did not define a fixed state in terms of their relationship with the technology but continued to evolve in relation to the concerns of individual lives. Using Ruth's example again, recall how she ultimately reduced her use of computers and the Internet because the benefits of intimacy with her son through email were inadequate and could be better served through the use of an international phone card. In this example the benefits also had to be mutually negotiated in relation to two separate social contexts, one in China and one in the UK, where the benefits had to be realised through the experience of emotionally fulfilling conversation at both ends. Again the socioemotional aspects of benefit realisation are apparent.

In other examples the relevance and benefits of computer and Internet use could be seen to multiply as part of ongoing appropriation. Sylvia from the Newhaven study started using computers and the Internet with a view to maintaining independence through online shopping opportunities but quickly moved onto creativity, social contact and knowledge acquisition in relation to her digital photography. This showed how the themes of relevance and corresponding benefits were not mutually exclusive but built on one another. With deeper engagement the benefits of use became personally meaningful and came to be defined not by the technology itself but by the opportunities for self development that were made available through it. In the following discussion the different themes of relevance are considered in turn exploring their relationship to the broader ageing experience.

Social Contact

Ongoing social contact was of prime importance to those seeking to appropriate computers and the Internet in this thesis and was the main way that computers and the Internet were defined as relevant across all the studies. Social contact was the driving force behind the use of email in the Newhaven and Age Concern studies; Peter's use of YouTube vlogging and acted as a major incentive for those playing the Wii in sheltered housing. In all of these studies it was spending time in the presence of others whether offline or online and interacting with them through the technology that made computer and Internet use meaningful. Given concerns about social isolation in relation to older

people (e.g. McCarthy and Thomas, 2004; Lee 2006) this may not be such a surprise. However the simple term 'social contact' does not adequately describe the nature of the different relationships that emerged through computers and the Internet nor does it capture their evolving character: the criteria by which such contact was deemed to be beneficial or the significance of such interactions in relation to 'ageing selves'.

For Erikson (1959), Carstensen (2006) and Tornstam (2005) it is an emerging sense of mortality in advanced age which brings a reconsideration of one's relationships with others and a renewed vigour in communications with others. In Erikson's case he felt that it was this that sparked the reconsideration of one's past social relationships through the life review and the subsequent reorientation in relation to one's current relationships. The social relevance of life review was certainly clear in Peter's early YouTube endeavours (these are returned to in more detail in the section on life review and reminiscence). For Carstensen it is "the subjective sense of remaining time until death" (2006, p. 1913) that reorients motivations towards goals that have emotional meaning, principally those that involve other people. This results in a growing need for emotional intimacy in one's communications with others particularly within established relationships. Carstensen suggests that this is a protective mechanism that appears with advanced age, designed to ward oneself against the anticipated negative emotional experiences associated with ageing and death. This is done by limiting social contact to those who are already familiar to one and whose emotional reactions can be anticipated.

In this thesis as in previous studies (Lindley, 2007 ; Melenhorst, 2002) aspects of Carstensen's (1992) socioemotional selectivity were evident in the use of email with existing family and friends rather than new acquaintances in both the Newhaven and Age Concern Drop-in Centre studies. The ability of different communication media to convey high degrees of emotional intimacy was seen as a way of assessing their 'usefulness' which also indicated socioemotional selectivity at work. In these two studies visual (Skype video calls) and aural (telephones) methods were preferred over the symbolic text-based aspects of email as they were deemed to convey greater emotional depth. Emotional intimacy as an emphasis in communication remained significant in the YouTube and Wii studies but was not directed towards existing relationships which was not in line with socioemotional selectivity. Here social contact was initiated with strangers and selectivity in social contact was not restricted to family and friends on the basis of emotional 'risk'. Difficult emotions were a significant part of Peter's involvement in YouTube and intrinsic to his emerging role there. So too with the Wii study where residents of sheltered housing were introduced to previously unknown people as part of the Wii Bowling League

ultimately forging new relationships as a result. Difficult emotions relating to performance anxiety were an intrinsic aspect of taking part in the public Wii tournaments. In both cases the ultimate aim was still to engage in emotionally rewarding interactions with others but not necessarily in an emotionally 'safe' manner as described by the theory of socioemotional selectivity. It seems that the benefits of emotional intimacy may be more complex and diverse than just the ability to control emotional risk. The foreknowledge of 'safe' communicative partners appeared to be more significant during the early phases of computer and Internet appropriation, i.e. adoption to active learning, but not necessarily in the later phases from active learning to deep engagement. Computer anxiety obviously played a part initially in raising the perceived emotional risk attached to using computers and the Internet and this may have increased the need for emotional security through communication with known others at this time. Given the emphasis of this study it would be difficult to say for certain whether this was a direct cause. The shift of social motives beyond emotional security may also suggest that expressions of socioemotional selectivity in everyday life are as much a result of the lack of social opportunities for older people in developed society as they are in response to ageing *per se*.

Reduced mobility with increasing age and the gradual erosion of convivial public spaces (Klinenberg, 2001) have affected opportunities for everyday social contact for older people in developed societies and may accentuate socioemotional selectivity. Peace, Holland, and Kellaher (2005) in their study of the relationship between older people's identities and their relationship to their immediate environment note that older people need spaces that allow "transition from the private world of the domestic interior to the public world of street life" (p.2). In their study they show how the grassed surrounds of residential homes act as common ground, buffering between private and public space but also acting as a conduit for intimate but well managed communication with the people that they met there. The computer and Internet-based accounts also show new social opportunities appearing which span public and private spaces. In Peter's YouTube example common ground was established through the presentation of publicly accessible videos online which provide a meeting point for exploring shared interests with thousands of other people of all ages across the planet. The Wii initiative shows more modest meeting places being established with peers in sheltered housing but still with unfamiliar others. Peace et al. (2005) also note the importance of "a comfortable gradient in the boundary between public and private places" (p.3) for older people to sustain their well-being and identity. Such a gradient is evident in Peter's ability to explore intimate communication with YouTubers in varying degrees by using video comments, personal YouTube messages, email or synchronous Skype chats. Similarly the Wii players are able

to depart from the group expectations of Wii sessions and tournaments in ways that suit them, forging individual friendships in their own way and in varying degrees, negotiating their own individual meetings where they see fit. Both these 'digital meeting places' provided social opportunities that did not encourage socioemotional selectivity but still provided *routes to intimacy*. Indeed all the examples of deep engagement in these studies remind us of a deeper human aspiration which goes beyond the need for emotional security – the enduring human wish to connect with others in a way that allows one to escape one's own limited definition of who one is and to become part of something bigger than oneself. It is in this transcendent sense that intimacy remained central to all expressions of appropriation in this thesis. Understood in this way the benefits of social contact were that it provided opportunities for coming to know oneself in the eyes of others rather than as an adaptive method of emotional containment. For Tornstam (2005) it is this self-transcendent dimension that goes hand in hand with a growing awareness of mortality and points to the underlying need for social contact that permeates the examples of deeply engaged computer and Internet use. This is reflected in the communal and altruistic behaviour of Sylvia, Peter and the deeply engaged Wii players through their open sharing and participation in their particular communities of practice. Here reciprocity, or the ability to give something back to the community is an important part of this involvement where the benefits are experienced as a sense of belonging and shared purpose. Gerotranscendence (Tornstam, 2005) typically implies a less self-centred attitude towards others and an ability to *play* with new roles as part of life experience, which are also evident in these examples.

This examination of appropriation sheds light on the potential of computers and Internet to change the experience of ageing in modern societies by offering opportunities for social participation and self development that have become less available to most older people because of industrialisation. This has implications for contemporary understandings of ageing. The experiences of the deeply engaged computer and Wii users challenge notions of socioemotional selectivity (Carstensen, 1992) which are currently being put forward as guiding principles for the design of communication technologies (Lindley, Harper and Sellen, 2008, Melenhorst et al., 2001) showing such social adaptations are not immutable aspects of ageing but can be culturally determined and cohort specific.

Intergenerational Connection

The appropriation of computers and the Internet in these studies took place to a backdrop of intergenerational connections. The underlying relationship between younger

generations and older people's computer/Internet use was central to an understanding of older people's appropriation as it appeared again and again, before and after adoption and then through active learning and deep engagement. There was evidence of this in all four studies. Experiences and advice from younger family members were particularly influential in increasing older people's curiosity about computers and the Internet prior to adoption. Direct requests for information and support from younger family members were not always encouraging however. In the Age Concern study many were actively discouraged from using them by younger relatives resulting in an internalised sense of computers and the Internet being 'not for old people'. Intergenerational connections also framed Peter's use of YouTube providing him with an incentive for ongoing use and opportunities for learning but also with challenges of acceptance within an online community dominated by the younger generation. The relevance of computers and the Internet to older people is clearly something which is challenged by some of the younger generation and older people themselves must be prepared to defy these 'social norms'. Intergenerational dynamics were multidimensional however and whilst they could be problematic, they also provided an important positive influence with regards to successful appropriation.

The pervasiveness of the intergenerational context throughout appropriation was also significant because it highlighted broader changes in developed society. Intergenerational contact beyond the bonds of family has become more limited over the last century with a trend towards a more peer-centred society in which different generations become segregated from one another according to their chronological age (Chudacoff, 1989). This has generally been in order to address social concerns such as child rearing, education, workforce training, employment and health care but has had other repercussions. Contact between generations, outside of the family, has in effect become institutionalised, occurring only when sanctioned within a professional context, e.g. between a student and a teacher or a young carer and older person. Everyday meetings between the oldest and youngest generations within a community are now rare (Williams and Nussbaum, 2001; Vanderbeck, 2007) and opportunities to share experience and resources across generations in a face to face manner appear to be diminishing. YouTube vlogging provided Peter with a new opportunity to re-engage with the younger generation in a way which was not constrained by the generational divisions that are now common in local communities and which did not suffer from the ageist stereotypes commonly associated with intergenerational communication (Nelson, 2005). The benefits that he has gained as a result of this engagement include opportunities to learn new technical literacies, an

interested and engaged audience for telling his life story to and an opportunity to give something of himself back to the younger generation. Much of the email use encountered at Age Concern and in the Newhaven study was also with younger relatives (whether children or grandchildren) showing just how important intergenerational ties remain, benefiting older people by including them in the lives of their younger relatives despite geographical separation.

Developmental theories which attempt to explain the importance of intergenerational communication are those which acknowledge life-long development through the social processes of which culture is reconstituted from generation to generation. Erikson's *life stages* have been particularly influential in guiding intergenerational theory and initiatives (Erikson, 1963; Erikson, 1986). Intergenerational theorists would argue that it is the parallel but evolving nature of Erikson's life stages that helps to explain the positive benefits that can be gained from intentional intergenerational programs (Newman and Smith, 1997). The oldest and youngest generations are engaging with similar life crises but from distinct vantage points along the path of life where dependency on others is in a process of readjustment whether waxing or waning. Some developmental psychologists would argue that the communication that takes place between generations is even more central to human existence than Erikson's stages imply arguing that the process of human development itself takes place within an intergenerational context. This is not only between children and their parents but also with grandparents. The importance of such intergenerational connections are now beginning to be acknowledged as having significant benefits in terms of childhood development and education (e.g. Newman and Smith, 1997; Larkin and Newman, 2001; Gamliel, Reichental and Ayal, 2007).

Some would argue that Erikson's model is too simplistic, hinging on the notion of an all or nothing resolution to life issues particularly in relation to the 'final consolidation' of old age. This implies a stronger transmission of experience and knowledge from the old to the young. More recent intergenerational theories would argue that development does not have an ultimate end-point (Tornstam, 2005; Williams and Nussbaum, 2001) and that it is 'multidirectional' (Williams and Nussbaum, 2001), i.e. just as likely to involve a sharing from young to old as it is from old to young. Understanding intergenerational communication therefore is about identifying what it is that is being shared in intergenerational exchanges and how common ground is established between the different age groups involved. Peter's YouTube example shows the reciprocal nature of these exchanges in terms of the knowledge that is shared (YouTube know-how from the younger generation and life experience from Peter) with obvious benefits in both directions. There

is also a simple mutual appreciation of one another's presence in an online medium. Peter's deep engagement with YouTube and his reluctance to use it as a platform for offering criticism or advice expresses an affinity with the younger generation which is characteristic of gerotranscendence (Tornstam, 2005). This implies benefits of a cultural and spiritual nature.

Reminiscence and Life Review

Whilst reminiscence opportunities are not confined to older people, advanced age does bring with it a store of memories to reflect upon. Throughout all the studies there were examples of reminiscence playing an important part in computer and Internet appropriation. Generally speaking people vary in the ways that they relate to their memories as they age and this was also the case in the studies. Staudinger (2001) suggests that it is possible to distinguish between different forms of reminiscence by the degree of analysis that accompanies the act of remembering. Whilst simple reminiscence does involve selective processes of memory retrieval that are reconstructive and dependent upon the socioemotional context, life review (or life reflection in Staudinger's terms) also involves reconsideration of those memories in light of current perceptions of self and ongoing comparisons with others which can lead to greater self understanding and insight. It should also be remembered that reminiscence can be maladaptive when it leads to irreconcilable regrets about the past and an inability to move on from painful memories (Coleman, 2006). The direct involvement of others can provide a meaningful context to reminiscence and life review adding another level to analysis by providing an external perspective on the self and interpretations of past events. Coleman (2006) highlights three distinct ways in which reminiscence can become a feature of later life which were relevant in the studies: identity maintenance; life review and cultural transmission. These can be mapped onto Staudinger's continuum with identity maintenance involving minimal analysis and cultural transmission the greatest.

Reminiscence acted as identity maintenance when memories were reflected upon in order to maintain a continuous sense of self. This may be particularly important where there has been dramatic change in an older person's life. Reminiscence became relevant in this way for Friderich who was web browsing at Age Concern, choosing to browse Hungarian websites so that he could virtually revisit places from his past, prompting his own personal and private recollections. Similarly Mary's rewriting of her favourite recipes provided her with an opportunity to revisit past times whilst establishing new skills with the computer. Reminiscence of this sort also played a part in some of the Wii sessions with

players being reminded of playing other games such as lawn bowls in the past. In these examples the reminiscence involved had a minimal degree of analysis but obvious selectivity in terms of associating particular past events with present activities. The benefits here are to do with re-affirming notions of oneself from the past and maintaining continuity.

Life review involves a greater reassessment of oneself in relation to past events and attempts to consolidate the whole of one's life as an achievement. As such it is an active search for meaning which has greater transformative potential but involves effort (Randall and Kenyon, 2001), creative endeavour (Sherman, 1991) and a reappraisal of one's life in the eyes of others. Both Erikson (1959; 1998) and Butler (1963) believed that the urge to engage in such life review was brought about by the growing awareness of one's own mortality in relation to the death of loved ones or personal experiences of disabling illness. Life review was evident in the Newhaven study with Bill re-evaluating his own values and life commitments but this was not directly through his use of computers and the Internet and he saw no apparent synthesis in this direction. In the same study Evelyn's process of life review resulted in her using the Friends Reunited website to re-establish contact with important people from her past. At Age Concern Ben's writing of his own life story for his children showed a creative life review process oriented towards a younger audience and a similar intergenerational approach to life review was explored by Peter's use of YouTube vlogging. Interestingly in Peter's example life review came to an end online having served its purpose, helping to transform his life situation and future goals. Life review can benefit older people by causing them to rethink coping strategies from their past, to accept losses, to creatively address unresolved conflicts and to revise their sense of self. Overall life review has been shown to have a positive effect on the well-being of older people (Bohlmeijer, Roemer, Cuijpers and Smit, 2007) including those suffering with dementia (Woods, 2005).

Coleman (2006) points to another purpose for reminiscence, that of *cultural transmission*, which has largely disappeared from industrialised societies but which was evident in Peter's YouTube example. Studies of reminiscence amongst remaining traditional agricultural societies (e.g. Gutmann, 1987) suggest that the role of elders in modern society has shifted away from one where the wisdom of old age is honoured to one where it is disregarded. Despite these cultural changes Peter's use of YouTube does seem to display aspects of cultural transmission with his younger viewers seeking his help and guidance as an 'elder'. The benefits here were again reciprocal with respect for Peter and emotional support for those that he helped.

The underlying reflective mode that elicits all forms of reminiscence may be more relevant to older people's use of computers and the Internet than is first apparent. Straudinger (2001) suggests that reflection of this kind only comes to the fore when older people have to make sense of new and unfamiliar experiences. This includes their early encounters with computers and the Internet and helps to explain why reminiscence and life review can play such a significant role in defining early use (from adoption through to active learning) for some of the participants and why it becomes less relevant at deep engagement.

Acquiring Knowledge

Computers can potentially enable older people to access a wealth of previously inaccessible information with relative ease through the Internet and to become more knowledgeable as a result. These benefits appear to speak for themselves. However, whilst there was evidence from these studies that the Internet was being used for accessing information in this way it was rarely used as a standalone digital information resource. Rather the information seeking behaviour that was observed was embedded in some kind of prior social involvement and was usually aimed at a purposeful goal, exemplifying an appreciation of experiential knowledge over purely cognitive solutions, i.e. a pursuit of *knowledge* rather than just as basic information. Those seeking web-based information at the Age Concern Drop-In Centre were initially prompted by friends, family and other media sources to look for information online and would often arrive at the centre with web addresses written on pieces of paper to direct their search. Similarly the Internet was not used as a standalone resource for learning about computers and the Internet with attendees always preferring to receive this information as experiential knowledge from other attendees or volunteer helpers. The same appreciation of socially embedded experiential knowledge was evident with Sylvia receiving advice via her digital photography websites in the Newhaven study and with Peter receiving technical advice from other YouTubers. Both of them eschewing books and preferring shared experiential knowledge as the most reliable source for developing their particular computer-based expertise.

What has been seen through this thesis is that the older people who were seeking knowledge recognised that information by itself was not going to be helpful to them and that what they wanted to know was how that information was relevant in specific contexts and how they should apply it. This reflected an awareness of the need to integrate both cognitive pragmatics and cognitive mechanics (Baltes and Smith, 1990) as part of

maximising their ageing potential. Overall it seemed that the older people in the studies required online information to have a socially embedded and experiential character in order to trust its authenticity as bona fide knowledge. Baltes and Baltes (1990) suggest that this kind of approach is indicative of older people's *adaptive competence* and that this changing orientation towards knowledge in later life is what is classically known as *wisdom* (Baltes and Smith, 1990; Baltes, Smith and Staudinger, 1992; Baltes and Staudinger, 2000). This gives an interesting contradiction with regards to the Internet, for whilst part of the power of computers and the Internet is in their ability to make the information they hold independent of their originators, these older people made an effort to re-establish that experiential (and relational) link between information and originator reinforcing the social significance and 'meaning' of that information.

Maintaining Independence

Use of computers and the Internet for maintaining independence is probably the one use that deals most directly with the deficits of ageing as experienced by the older users. Potentially computers and the Internet provide opportunities for them to maintain their independence and to develop greater self reliance by improving their access to information, goods and services which would help them to achieve daily living tasks without help from others despite any mobility constraints that they may have had. The overriding sentiment of the older people in these studies living in the community was towards independent living as an ideal way of living. This was clearly stated in the Newhaven study as an appreciation of living alone as well as by Peter in the YouTube study. However the use of computers and the Internet to further support independent living was not seen as an obvious conclusion with its appearance often increasing dependence on others. Computers were only seen as supporting independence once there was a reasonable degree of proficiency and this required a degree of forethought in relation to the anticipated effects of the 'deficits of ageing' and a willingness to be dependent on others as part of the learning process. It seemed that this initial dependence during learning could be problematic for some as it contradicted the underlying push for independence. This was certainly the case for the reluctant adoptees in the Newhaven study and deterred them from further appropriation. A similar dismissal of computers because of the need to learn computer skills has been shown to offset the perceived benefits of computer and Internet use in previous studies (Melenhorst, 2002) and also with Arthur in the Newhaven study. This dismissal was deemed in both cases to be the result of a subjective sense of limited future time in line with Carstensen's (2006) theory of socioemotional selectivity and not to do with independence issues. However increased

dependency during learning had an effect in this thesis in terms of negating further appropriation of computers and the Internet.

For those willing to defer independence opportunities until they had attained the necessary proficiency, the possibilities for supporting their own material needs remained an important motivation. This was seen in the Newhaven study with Sylvia and Maureen keen to purchase goods online along with Barbara from the Age Concern study. Here the perceived benefits were to do with minimising the physical effort required to obtain everyday necessities such as groceries and (in Sylvia's case) of managing daily care responsibilities. For others in the Newhaven study such as Jill these were not seen as benefits at all, negating opportunities for meaningful physical and social activity. Selectivity (Baltes and Baltes, 1990) can be seen to influence appropriation here by defining whether or not perceived benefits fit with existing resources and whether new skills should be developed further. For Jill there appeared to be a choice being made between socially embedded activity and use of the computer which she perceived as an isolating activity.

The drive to maintain independence was also evident in the pursuit of employment amongst those at the Age Concern IT Drop-in Centre. Doug and Heleen used computers and the Internet to explore job opportunities so that they could remain financially independent. Here the benefits were to do with retaining economic freedom in spite of limited retirement funds. Given the increasing ageing populations in the developed world and accompanying demands on the economy with respect to pension benefits it seems likely that this will be a growing trend.

The instinct for independence was also apparent in more subtle ways. Throughout the studies there were examples of computers and the Internet being used by the older users as ways of challenging or competing with themselves to maintain physical and mental dexterity. Here independence was of a much more personal and immediate sense: being able to depend on their own faculties to undertake everyday tasks. Both Jill in the Newhaven study and Don in the Wii study commented on the importance of keeping physically and mentally active in this way through their engagement with computers and the Wii respectively. Indeed the very act of learning about computers and the Internet was also interpreted in this way, providing a mental challenge. Here selectivity (Baltes and Baltes, 1990) reappeared not in terms of choosing discrete activities but through optimising existing capacities and compensating for those that have deteriorated. The use of practice by those at Age Concern's IT Drop-in Centre and by their Wii players was an

expression of optimisation whilst the use of notebooks at the Drop-in Centre was compensation for poor memory.

Creativity

Overt forms of creativity were associated with those individuals who attained the deepest level of engagement with computers and the Internet. Both Sylvia from the Newhaven study and Peter on YouTube were engaging in obvious creative activities which framed their use of the technologies and motivated their deepening appropriation of them. For Sylvia this was as a digital photographer and for Peter as a video maker; both of them considering themselves to be artists of some kind with their activities resulting in the creation of 'virtual products' and allowing them to express ineffable and gerotranscendent aspects of themselves.

It could be argued that creativity goes beyond this purely productive notion however and is concerned with the process which underlies it, that of opening up to new ideas and generating novel solutions and expressions of self. In this sense creativity was more central to both adaptations to ageing and appropriation than it first appears. The ability to take on board new ideas and to generate novel solutions as aspects of creativity were intrinsic to appropriation of computers and the Internet in this thesis. This was perhaps most noticeable during the adoption phase when it became important to drop previous work-based notions of computer use in order to establish new meaningful uses. Playfulness, another creativity related quality, was also important in early interactions. This is an important precursor to creative activity particularly in relation to computer use (Webster and Martochio, 1992) as it encourages the openness to interpretation and exploration needed to learn and use such technologies and to engage in creative activities which often have a non-specific end goal. This was perhaps most noticeable amongst the Wii players but also true of those learning to use computers at the IT Drop-in Centre with a limited understanding as well as being part of the trial and error approach taken by Sylvia in the Newhaven study and by Peter on YouTube.

Creativity in its broader sense also formed part of the reminiscence and life review activities already mentioned in this chapter where new understandings arose from recollections of the past in a new context. This was clearly part of Peter's experience of YouTube life story telling and true for Evelyn in the Newhaven study as well as all those involved in reminiscence at Age Concern. Fisher and Specht (1999) outline an important relationship between creativity in this broad sense and 'successful' ageing, highlighting its positive effect on an individual's sense of purpose, their interactions with others, personal

growth, self acceptance, autonomy, health and cultivating purposeful and meaningful involvements.

Implications for Accessible Design

The lens of appropriation used in this thesis has provided a broader view of access than that which is currently being used in accessibility models for older people (e.g. Holt, 2000; Agelight, 2001; NIH/NLM, 2002; Coyne and Nielsen, 2002; AARP, 2005; W3C, 2005; Kurniawan and Zaphiris, 2005; Fidgeon, 2006; Abou-Zahra et al., 2008). Appropriation moves beyond the functional concerns at the interface which current models of accessibility are built upon and gives credence to other social and motivational factors which are significant in defining the person-technology dynamic throughout the appropriation process but absent from current accessibility models. The different ways that relevance is established (i.e. the six core themes) determine ongoing motivation for engagement and frame interpretations of particular applications. Access in an appropriation sense can be thought of as being defined by an ecology. The following diagram summarises this broader ecological view of access:

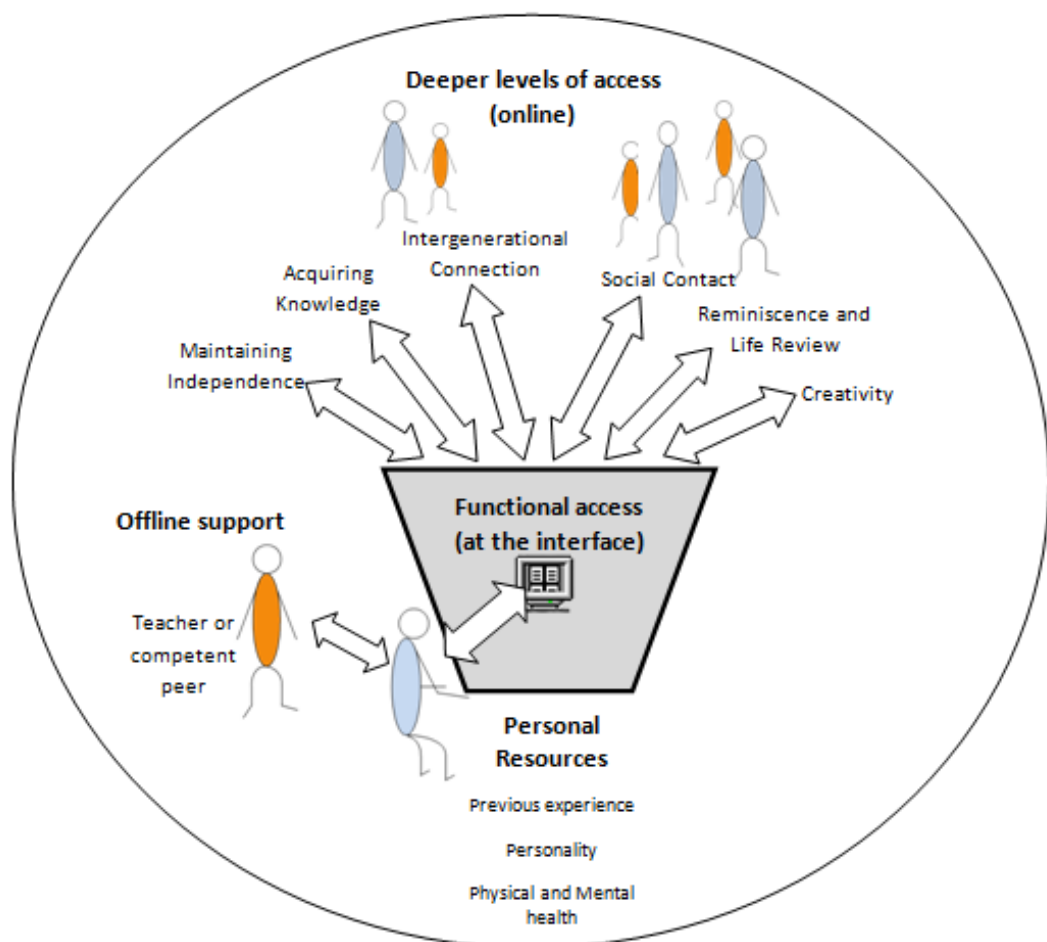


Figure 30 : Ecological view of older people's access to computers and the Internet

With this ecological view *access to meaningful experience* becomes the overriding concern rather than just *access to functionality at the interface*. Whilst this functionality remains important it is only one part of an ecological whole. In taking this ecological view it becomes clear that providing access to appropriate offline social support and the deeper levels of access described by the themes of relevance is central to achieving successful appropriation. This should be acknowledged in approaches to accessible design for older users. Providing resources that emphasise the deeper social and motivational aspects of access described by the core themes are likely to encourage appropriation. These themes already exist as design agendas in their own right within the HCI field. Whilst it is not possible in this thesis to explore each of these research areas in great depth there follows a brief discussion of how each theme might connect to these existing accessible design agendas.

Social Contact. The social use of computers and the Internet has become a huge area of interest within HCI (Wellman, 2001) and this is one area of design research where adaptive responses to ageing have been considered (although not in relation to appropriation). Studies with older people using email systems suggest that the intimacy between family and friends engendered by socioemotional selectivity would be best served by increasing the craft involved in creating messages. Such measures should strive to allow older users to communicate content in a personally transparent and reciprocal nature but also in a way that would indicate the dedication of time and effort that has gone into their communication (Lindley, Harper and Sellen, 2009; Riche, Henry Riche, Isenberg and Bezerianos, 2010). Design suggestions have involved restricting channels of communication to only 'nearest and dearest' and employing electronic handwriting as a means of personalising communication and reinstating possibilities for crafting (Lindley et al., 2009). The findings of this thesis would concur with the need to support intimacy through personal transparency as this was highlighted in all the studies. The findings would also suggest that communication media which convey a high degree of social and embodied presence (i.e. those that go beyond the use of text and support other synchronous and asynchronous forms of video-based and embodied communication) are more likely to achieve an acceptable degree of intimacy. In addition this thesis would suggest that encouraging social contact to family and friends is perhaps an approach to take early in the appropriation cycle. A more open approach to social contact would still be beneficial to some older users later on in the appropriation cycle if it retained an emphasis on intimacy. Online social media should enable these different *routes to intimacy* by

enabling both private and public presentations of self in varying degrees, giving control to the user in accordance with their own social preferences.

In this thesis social contact was also shown to play an important part in motivating the appropriation of computers and the Internet. From the outset computer systems could provide the opportunity for online social support with a high degree of social presence to contextualise meaningful use. Ideally this could be connected to family and friends with computer experience but could also be done with volunteers or even members of an appropriate online community.

Intergenerational Connection. The intergenerational context is also becoming an important one for designers and researchers developing computer-based technologies (Harley, Kurniawan, Fitzpatrick and Vetere, 2009c). Some of these efforts have focused on supporting social connectivity between generations within families through the sharing of presence information via message boards and video links in dispersed family homes (Hutchinson, Mackay, Westerlund, Bederson, Druin, Plaisant, Beaudoin-Lafon, Conversy, Evans, Hansen, Roussel, Eiderback, Lundquist and Sundblad, 2003; Plaisant, Clamage, Browne, Hutchinson, Bederson and Druin, 2006; Vetere, Davis, Gibbs and Howard, 2009; Lindley, Harper and Sellen, 2010). Others have focused on the development of computer-based games and activities that augment face to face intergenerational play and interactions within families (Vetere, Nolan and Raman, 2006a; Vetere, Davis, Gibbs, Francis and Howard, 2006b; Davis, Skov, Stougaard and Vetere, 2007; Vetere et al., 2009). As one might expect intimacy and reciprocity are again important in defining these family interactions. Communication media which can convey the intimacy of such relationships have been signposted as important (Davis et al., 2007) and numerous media have been tried. These again involve the use of electronic handwriting on shared displays (Lindley et al., 2010) and via digitised paper notes (Plaisant, 2006) shared electronically with distant family as well as photo sharing using camera phones (Vetere et al., 2009; Lindley, 2010). In a play context webcam-clips, animations, text messages, and pictures have also been used to support intimacy (Davis et al., 2007) together with the game itself of course which was hide and seek in this case. The intergenerational contact in these examples was also characterised by a shared attitude of playfulness and an asymmetrical allocation of roles and responsibilities during interaction (Plaisant et al., 2006; Davis et al., 2007; Vetere et al., 2009; Lindley et al., 2010). Design suggestions which incorporate these aspects of the intergenerational context explore opportunities for fun, playful interactions using games that both age groups can engage with and provide asymmetrical access to

game functionality at the interface which allows the older person to define the dynamics of the interaction (e.g. Davis et al., 2007).

In this thesis the importance of *intergenerational contact within families* has also been clear with examples in all the studies. However, the focus of these interactions has been either on learning about computers and the Internet or just communicating with one another as an end in itself both of which are implicit aspects of these relationships which are easily ignored by research aimed at generating new design solutions. In addition through Peter's YouTube example the importance of *intergenerational contact outside of the family* is clear. Clearly intergenerational connections were important motivators for all the older users to engage with main stream computer and Internet use but often the asymmetry seen was reversed to that found in the design research with younger people often being the holders of computer knowledge and 'in control' rather than the older person. This suggests that asymmetry in functionality at the interface would not necessarily be helpful in everyday applications where the acquisition of technical literacy is intrinsic to that intergenerational contact. Peter's example of appropriation via YouTube also shows how asymmetry can be defined through the social roles assumed by different age groups in an online environment, with Peter for example assuming the role of life history teller as a way of framing social interaction and using genre to substantiate this role.

The success of computer-based technologies in a non-familial intergenerational context seems to rest on their ability to support expressions of common ground. This is largely dependent on individual attitudes towards other age groups and their ability to negotiate a shared sense of relevance and purpose. In support of this online social media that promote transparent rather than anonymous presentations of self which reflect age faithfully may be more likely to facilitate intergenerational trust.

Reminiscence and Life Review. In this thesis reminiscence has played various roles in the lives of older computer users including reminiscence as identity maintenance; life review and cultural transmission. Central to all these examples was the idea of reflecting upon past events and reflection does figure in HCI as a broad design research agenda (e.g. Hallnäs and Redström, 2001; McCarthy and Wright, 2004; Dalsgaard, 2008; Fleck and Fitzpatrick, 2009). Providing opportunities for reflection in the midst of computer use has been suggested as part of 'slow technology' (Hallnäs and Redström, 2001), that is the ability to slow the pace of interaction down when needed and to not be driven by the demands of the technology. This was certainly part of the Wii Bowling experience in

sheltered housing and added to opportunities for reminiscence. The same was true for Peter's life history video making on YouTube.

Design research focusing explicitly on reminiscence as reflections on past life events has explored the role of memory prompts in eliciting reminiscences primarily through the use of life logging and social media (Cosley, Akey, Alson, Baxter, Broomfield, Lee and Sarabu, 2009; Peesapati, Schwanda, Schultz, Lepage, Jeong and Cosley, 2010). Unfortunately these technologies are inaccessible and inappropriate to most older computer users whose mementos are often in a physical form and not conducive to immediate digitisation existing as diaries, photos, letters, newspaper clippings or even more ephemeral forms such as songs or smells (Cosley et al., 2009). This has been an obstacle for involving older people further in computer supported reminiscence work. The only examples are those working with individuals with dementia where the digitisation of personal photos has been undertaken by researchers (Gowans et al., 2006; Kuwahara, Abe, Yasuda and Kuwabara, 2006). Whilst beneficial this cannot add to an understanding of appropriation processes in relation to computers and reminiscence.

In this thesis the older computer users played a much more active role in the process of digitising memories. Mary at Age Concern transcribed her handwritten recipes and Ben his life history both into electronic documents. Peter created YouTube videos using old photos, songs and memories. This transcription process was itself an opportunity for reminiscence and gave meaning to the active learning part of computer and Internet appropriation. Another important element of these reminiscences was the availability of a social context to transcribe them for. These social and performative aspects of reminiscence have been acknowledged as significant but lacking in current reminiscence design (Lindley, Randall, Sharrock, Glancy, Smyth and Harper, 2009b; Peesapati et al., 2010). They are of course difficult to orchestrate purely through design being dependent on an engaged audience.

Taking an appropriation stance towards designing for reminiscence should emphasise the transcription processes from 'old' to new media seeking to make this a meaningful, enjoyable and socially engaging task of itself.

Maintaining Independence. Perhaps the most significant area of research in which computer-based systems are currently being developed for older people to support 'independent living' (e.g. EC 2007a) or 'aging in place' (e.g. Mynatt et al., 2000). Relevant initiatives such as assistive technology (Audit Commission, 2007; Goodman, Brewster and Gray, 2002; Szymkowiak, Morrison, Gregor, Shah, Evans and Wilson, 2006), Telecare

(Barlow, Bayer and Curry, 2005) and 'Smart Homes' (e.g. Bowes and McColgin, 2005; Stefanov, Bien and Bang, 2004; Perry, Dowdall, Lines and Hones, 2004) all take a deficit driven approach to ageing which envisages computer-based technologies as replacements for lost physical, cognitive or social function. In this thesis the appropriation of computers and the Internet could also be seen in terms of positive adaptations to ageing through selectivity with optimisation and compensation (Baltes and Baltes, 1990). Current approaches to design for independent living emphasise the compensation aspect, ironically increasing dependence on the technology and negating opportunities for selectivity with optimisation which could enhance independence. In this thesis computer users and Wii players were seen engaging in practice and self challenge as ways of optimising their existing abilities. Offering practice opportunities within computer applications or websites that focus on optimising existing abilities is one way in which they could be designed to support independence in line with adaptive ageing.

Acquiring Knowledge. Research concerned with the creation, organisation and accessing of computer-based information and knowledge is relevant here. This takes place under the guise of knowledge management, expert systems, information architecture, information needs and information seeking behaviour. Design research focusing explicitly on older people's acquisition of knowledge through the Internet remains minimal but has explored their information needs in terms of usability issues (e.g. Sayago and Blat, 2007) and age specific search strategies (Chin, Fu and Kannampallil, 2009). Problems with computer mouse control and information overload have been shown to interfere with online information seeking activities just as seen in the Age Concern IT Drop-in Centre. Recommendations of prior research were in line with functional accessibility measures and sought to lessen cognitive load by minimising the information displayed at any one time. Interestingly research looking at search strategies used by older people (Chin et al., 2009) has shown that the complexity of the information may not be an issue when it relates to prior life experience and knowledge. Older Internet users can perform better than their younger counterparts when the search task is ill-defined and relates to existing knowledge, using a superior top-down approach to achieve their aim (Chin et al., 2009). Those searching the web at the Age Concern Drop-in Centre tended to search for information that they already had some knowledge of prior to searching which would suggest that this is also one of the ways that they optimise their abilities (i.e. selectivity with optimisation). Design suggestions from prior research were to provide information architectures that supported this top-down approach and to provide visualisation tools that would allow users to track their browsing activities. At Age Concern the use of

handwritten notes was also an important aspect of this kind of information seeking behaviour acting as a conduit between offline and online sources of knowledge and providing compensation for poor memory. Devising an easy method for transferring handwritten URLs to the web browser and vice versa would allow users to locate online information more readily and aid their information seeking. Again electronic handwriting techniques used in other areas (e.g. Lindley et al., 2010) may be an interesting way to achieve this.

An important characteristic of the information seeking seen at Age Concern was the way that it was embedded in social participation both in terms of initiating searches for information and in terms of validating interpretations of the information that was found. Design approaches for information seeking that ignore these aspects of knowledge acquisition are likely to be less fruitful for older users. For them it was important that the connection between online information and the human originator of that information was made clear and transparent for it to be considered authentic. Websites that can establish a suitable level of accountability in these terms are more likely to be acceptable to older users.

Creativity. HCI has had a longstanding interest in encouraging creativity through the use of computer systems (Farooq, Carroll and Ganoë, 2005) but studies involving older people have been rare (Carell and Herrmann, 2009). Approaches that seek to encourage creativity usually involve the generation of novel ideas and solutions through *divergent thinking* along with activities (sometimes shared) which fix the result in a single process or product, i.e. *convergent thinking* (Farooq, 2007). Providing sources of inspiration to spark new thinking and ideas can be problematic for older users when they are unfamiliar with computer-based environments. Studies involving older people have turned to everyday experiences for creative inspiration but have come up against the problem of integrating old and new media as part of creative exploration (Carell and Herrmann, 2009). Within this thesis similar overt forms of creativity were undertaken by Sylvia in the Newhaven study and Peter on YouTube. In both examples they struggled initially to integrate old media into new media presentations with Sylvia's disregarded use of film photography and Peter's use of a radio sound track in his first YouTube video. With suitable additions to their technical arsenal in the form of digital cameras and an increasing literacy which allowed them to explore online opportunities they were eventually able to take inspiration from the outside world and others' work as part of their further appropriation. Their online involvement ultimately provided opportunities to share in co-creative forms of convergent thinking which added to their creative engagement. Playfulness (a precursor

to creativity) also played a part in these creative endeavours as well as those of the Wii players in sheltered housing and is also an important area of research within HCI (e.g. Blythe, Monk, Overbeeke and Wright, 2003). Design suggestions in relation to creativity can focus on methods for transcribing old into new media as inspirational resources in the same way as suggested for reminiscence.

Summary

In this chapter an ecological rather than functional view of accessibility was proposed. Appropriation was discussed in terms of the six core themes which framed older users' interpretations of computers and the Internet. This discussion illustrated that the relevance of computers and the Internet was not defined by the *negative* deficits of ageing but by their potential to support *positive* adaptations to ageing, highlighting the presence and significance of continuing self development for these older people as part of their appropriation of computers and the Internet. *Social contact* developed through *routes to intimacy* within and beyond family connections giving opportunities for less self-centred and altruistic relationships with others. *Intergenerational connections* were established which promoted a growing awareness and appreciation of different generations despite the growing dislocation of those generations in industrialised societies. *Reminiscence and life review* opportunities allowed the cultural value of life experience to be acknowledged. The *acquisition of knowledge* gave expression to forms of everyday *wisdom* in older computer users. Opportunities to *maintain independence* through computers and the Internet strengthened notions of *self reliance* and *creativity* offered opportunities for transcendent self expression. Together these arising values were intrinsic aspects of the ageing selves encountered in this thesis and showed a synthesis between their computer and Internet use and their own self development. Current deficit-driven models of design implicit in accessibility struggle to accommodate these aspects of use and a positive design stance that could act as a counterpoint does not yet exist.

This discussion also showed how the relevance and benefits of computers and the Internet were not static features of design but fluid qualities of an ongoing relationship with the technology where individual experience, life changes, new learning and the emerging character of new computer-mediated social contexts brought reinterpretations of the relevance and benefits of these technologies. The implications of appropriation for accessible design were then considered in relation to existing research agendas in line with the core themes of relevance. Understanding the transformational potential of

appropriation in terms of enabling older people's access over time means considering it as a process of change which is covered in the next chapter.

Chapter 10 – Appropriation as a Process of Change: Implications for Support and Accessible Design

Covered in this chapter:

In this chapter a process model of change is finalised based on appropriation and the implications of such a model are considered in terms of accessible design and support initiatives for older people using computers and the Internet.

Appropriation as a Process of Change

The majority of research addressing older people's engagement with computers and the Internet³⁹ has taken a rational approach to understanding it using models of accessibility (e.g. Stephanidis, 2001a; Savidis and Stephanidis, 2006; Newell and Gregor, 2000; Schneiderman, 2000; Keates and Clarkson, 2004; Klironomos et al., 2006), technology adoption (Compeau and Higgins, 1995; Rogers et al., 1998; Hill et al., 2008) and technology acceptance (Venkatesh and Davis, 1996; Ryu, 2008). Such approaches conceive of change in terms of a planned progress from one static state to another with a predictable journey towards a pre-established end goal or purpose. When applied to older people's use of computers and the Internet they are apt to ignore the fluid, changeable and unexpected aspects of this engagement that arise as subjective and contextual adaptations to a broader ageing experience. In this thesis appropriation has been used to show the dynamic process of psycho-socio-technical change that underlies older people's engagement with computers and the Internet and which sits within this broader experience of adaptive ageing.

The second research aim will now be accomplished by finalising a process model of appropriation and then using this to reframe notions of accessible design and support initiatives for older people using computers and the Internet.

³⁹ Except for a couple of isolated studies looking at their domestication (Hynes and Rommes, 2006) and familiarisation (Turner, 2008).

'Successful' appropriation of computers and the Internet by the older people in these studies was shown to progress in a cumulative developmental fashion where the person-technology dynamic changed qualitatively over time building on previous definitions of relevance and purpose and developing new ones along the way, finally emerging into beneficial and personally meaningful engagement with these technologies. Four basic phases were identified for appropriation which were (1) non-adoption, (2) adoption, (3) active learning and (4) deep engagement. The beginning of each phase was not always distinct with the availability of a supportive and technically literate social context heavily influencing ongoing appropriation. Rejection of computers and the Internet could occur at any point along the appropriation trajectory but points of departure centred on the transitions between phases which were described as: 'growing awareness'; 'reframing of purpose' and 'development of computer-mediated presence'. Alongside these psychosocio-technical transitions were shifts in notions of self in relation to computer and Internet use from ones defined by prior work-based roles at adoption to functional (e.g. Baltes and Baltes, 1990) and social (Carstensen, 1992) adaptations during active learning and finally to gerotranscendent (Tornstam, 2005) ones at deep engagement. The full appropriation cycle is described in figure 31 below:

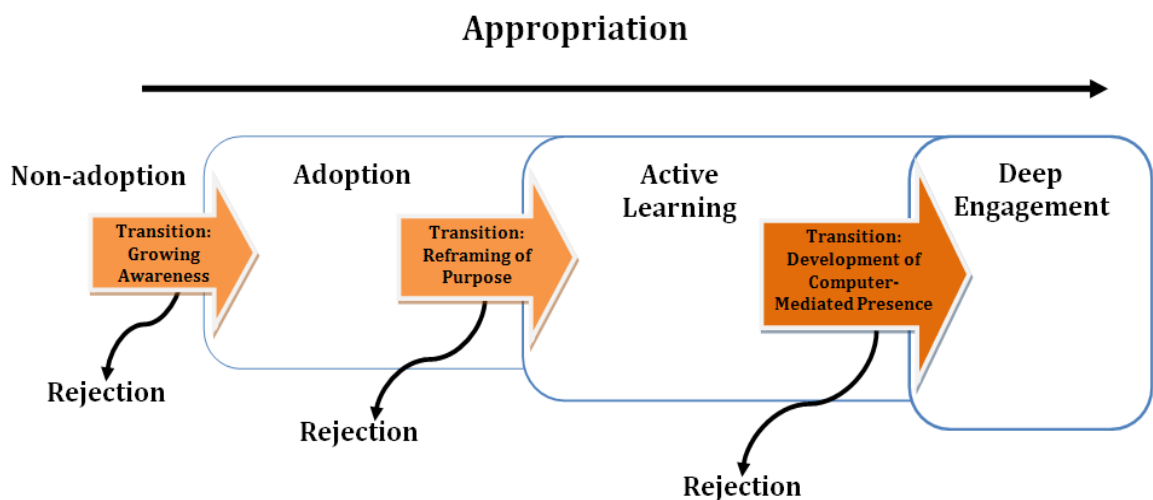


Figure 31: Final Appropriation Process Model

As established in the previous chapter, six core themes framed appropriation throughout, providing a broad sense of relevance and purpose to computer activities within an individual's ageing context. However the appropriation seen was also inherently idiosyncratic, depending upon previous experience with similar technologies, existing skills, knowledge and the changing nature of the social context throughout appropriation. It was a mixture of individual adaptations and socially negotiated acceptance to computer

and Internet use that defined a particular person's appropriation trajectory over time and the way that they realised any benefits. Following the trajectory of a successful appropriation there were increasing levels of individual awareness, embodied skills, knowledge about computer terminology, levels of computer-mediated social engagement as well as shifting interpretations of relevance and purpose. It was also clear that the social context in which use took place helped to frame the sense of relevance, introducing alternative uses as well as informing individuals in terms of specific technology-oriented literacies. The different phases of appropriation will now be worked through to explore the specific dynamics of each phase and the process of transformation inherent within them, identifying supportive factors and obstacles to further appropriation throughout.

Rejection

Throughout the studies there were only two examples of computer and Internet rejection, one in the Newhaven study and one at the Age Concern IT Drop-in Centre. Given that the focus of the research was on addressing appropriation rather than rejection this should not be taken as representative of all reasons for rejection. However these examples can give us some insight into considerations involved in the initial adoption decision. In the Newhaven study Arthur's decision to reject computers reflected an affirmation in his life rather than a defeat. He saw the time necessary for learning how to operate a computer as too costly in relation to his central concerns which were focused on contemplation and meaningful social contact. His perception that he had limited life expectancy was significant here and the technology was not seen to offer value in terms of offering intimate social contact or space for contemplation, i.e. they were not relevant to his way of living. Glynis at Age Concern had brought herself round to the idea of learning about computers but this was initially accompanied by a sense of alienation rather than the anticipated possibility of immediate social contact through the use of computers and the Internet. Whilst she had decided that they could be relevant to her in some way, the benefits were not what she had anticipated. The broad reasons for rejecting the technology in these examples could be seen to reflect the lack of fit between pre-existing positive adaptations to ageing and the perceived opportunities made available through computers and the Internet, i.e. they involved positive and elective choices or selectivity (Baltes and Baltes, 1990) which did not marry with the opportunities they perceived as coming through computer and Internet use.

Transition -> Growing Awareness

Social Context

As adoption models suggest (Rogers, 1995), awareness of computers and the Internet tended to come out of the existing social context. Friends and family were particularly influential as early initiators of interest and as potential sources of future computer-mediated contact. However they could also attempt to exclude older relatives by defining these technologies as inappropriate for them. For instance the son of Dorothy at Age Concern's IT Drop-in Centre ridiculed her attempts at sending him emails. This and other examples suggest that there is no inevitability about adoption as Rogers' (1995) model might suggest but that it can remain a contested issue within families. Other media were instrumental as sources of independent information and as ways of arousing general awareness and curiosity. This was particularly evident through newspapers, radio and television.

Previous Experience and Attitudes

Work-based experience with computers during previous working lives was significant in raising awareness as found in previous studies (Hilt et al., 2004; Ofcom, 2006) and this left many with preconceptions of what they were for: machines for productive, solitary and unenjoyable activities. (Lehtinen et al., 2009). In these cases a correspondingly negative attitude had developed with regards to their future use as a consequence. This was most evident amongst the reluctant adoptees of the Newhaven study who had not been deterred from adopting computers and the Internet but found little enjoyment in using them.

Anticipating Decline

Anticipation of a future life affected by the 'deficits' of ageing in the form of loss of mobility meant that some of the older users were interested in ways that computers and the Internet could help them to remain as independent as possible. This proactive mentality was rare amongst the older users in this thesis however. Only Sylvia from the Newhaven study expressed such an attitude and her use of the computer did not ultimately reflect this interpretation of purpose. The absence of deficit driven interest again highlights the importance of computer and Internet use as a 'positive' adaptation which can add something to the ageing experience as motivating initial interest.

Appropriation Phase 1: Adoption

Definition: the decision to engage with computers and the Internet by purchasing the equipment for the home or making regular use of them at a public venue.

For those that did decide to adopt computers and the Internet this wish came out of a growing awareness of how they might be relevant to their lives. The potential relevance and benefits of computer and Internet adoption were still hypothetical and remained unrealised at this point. Again ideas of relevance were initially gleaned from the media, prior personal experiences with similar technology and the attitudes of family and friends. They remained framed around understandings of computers primarily as work machines with correspondingly functional and solitary ideas about their potential uses which implies that the sense of self in relation to computer use was attached to roles that had been taken during working life.

Transition -> Reframing of Purpose

At this stage the computer and Internet connection were made available within the home or public venue but the relevance and benefits of their presence had not been realistically established. The singular notion of purpose which justified initial purchase decisions was not necessarily conducive to further appropriation and alternative forms of relevance had to be discovered. This was essentially a process of *unlearning* preconceptions of use and of opening up to the possibility of alternatives. From a rational perspective this is problematic as it implies an interruption to the planned intentional process present at adoption. In terms of appropriation it can be seen how a revised sense of self (no longer framed around work) can emerge in relation to the technology. Again offline media sources such as newspapers, magazines, television and radio programmes could be instrumental in raising awareness of alternative uses for computers and the Internet as were interactions with friends and family. However new ideas of relevance and purpose revealed themselves most directly as a consequence of initial use and the social context that surrounded it.

Supportive Factors:

Social Context of Initial Use

The context of initial use was pivotal in establishing an ongoing appropriation trajectory. When supported by individuals with an awareness of alternative uses computers and the Internet were quickly reframed as opportunities other than those related to work-based tasks (or other prior framings) became apparent. The relevance of computers and the

Internet was learned from others through discussion, observation, direct instruction and through the establishment of a decorum within that context. Perhaps the most directed example of this reframing was the Wii initiative in which computer use was presented as a form of social entertainment. Age Concern volunteers at the IT Drop-in Centre were also involved in reframing computer and Internet use by suggesting possible uses and corresponding applications in tune with different users. As domestication studies have shown previously (Hynes and Rommes, 2006) 'warm experts' (Bakardjieva, 2001) such as these who have technical knowhow but can also acknowledge the different motivations of users are empowering at this stage.

Ability to Redefine the Sense of Purpose

Overall the success of initial encounters depended upon the ability of older users to develop their own sense of relevance and purpose beyond their own preconceptions. Of particular importance here was overturning the identification of computer use as a solitary activity and realising its social potential, appreciating the importance of the Internet in redefining computer use in this way. An attitude of creativity and playfulness was also helpful here, supporting an openness to exploring and interpreting new possibilities. Again the decorum established by others present helped in this regard.

Establishing a Good Fit with Existing 'Positive' Ageing Adaptations (the Six Core Themes).

Throughout all the studies those that managed to establish a good fit between a sense of relevance in line with their ongoing adaptations to ageing and the opportunities afforded by the technology were most able to use computers and the Internet in a sustained manner and further appropriation. New identifications of relevance could then be translated into benefits for that person. As discussed in the previous chapter six core themes of relevance were identified across the different studies. These were: 1) social contact; 2) intergenerational connection; 3) reminiscence and life review; 4) acquiring knowledge; 5) maintaining independence and 6) creativity.

Obstacles to Further Appropriation:

Increased Dependence on Others

There was resistance amongst some of the adoptees to relying too heavily on computers particularly the 'reluctant adoptees' of the Newhaven study. In addition further appropriation was seen as synonymous with greater dependence on others in terms of helping them to learn as well as encouraging greater dependence on the technology itself. Neither of these scenarios was seen as beneficial or desirable by these reluctant adoptees.

Computer Anxiety

High levels of anxiety were common amongst all those encountering computers and the Internet for the first time. Those that were unable to develop their own sense of relevance or purpose in relation to computer use continued to experience this anxious state and this became a real deterrent to further appropriation. Computer anxiety did not immediately disappear for those who did find their own sense of purpose but was accepted as part of ongoing use and reduced with further appropriation. Computer anxiety is a well documented feature of older people's early encounters with computers (Ellis and Allaire, 1999; Charness and Czaja, 2005). Its presence reiterates the emotional nature of the person-technology dynamic currently ignored by rational approaches such as adoption and accessibility. Through an examination of appropriation the overriding effect of computer anxiety on judgments of relevance became clear, particularly amongst the 'reluctant adoptees' of the Newhaven study, interfering with their ability to entertain alternative interpretations of use for computers and the Internet.

Lack of Openness to New Potential

Moving beyond adoption was not necessarily straightforward and early definitions of relevance and purpose (as work machines) could persist unless challenged through alternative uses. In the Newhaven study it was clear that quite definite negative attitudes had developed towards computers and the Internet despite adoption. Potentially relevant alternative uses for computers and the Internet were also discounted because of the imagined repercussions of projected further involvement, as with Jill in the Newhaven study anticipating negative effects on her daily social life. In these examples the selective narrowing of future goals described by selectivity (Baltes and Baltes, 1990) was at odds with further appropriation.

Appropriation Phase 2: Active Learning

Definition: The point at which general interest or curiosity turned into a commitment to learning how to use specific features identified by users as relevant to themselves.

‘Active learning’ started when there was not only a marriage between a *personal* sense of relevance and the technical opportunities available but also a commitment to learning the necessary technical literacies through discovery and experimentation in spite of limited prior knowledge. Once learning started to progress the benefits of using computers and the Internet began to be realised on an emotional level with moments of enjoyment countering computer anxiety and reinforcing the initial sense of purpose. Growing literacy brought with it an increasing awareness of other purposes for the same technology and other avenues for learning. Here an embodied technical literacy emerged which supported an exploration of technological opportunity revealing new purposes as a result of ongoing learning. Underlying this phase was a commitment to learning embodied pragmatic skills related to particular computer applications and the devotion of space and time in order to do this. The sense of self that emerged here was one that was immediate and embodied with an awareness of ageing limitations.

Mapping of a Sense of Relevance to Technological Opportunity

Here, ideas of relevance provided direction by dictating choice of specific applications (see table 28 below).

Table 28: Themes of relevance mapped to applications used

Theme of Relevance	Applications Used
Social Contact	Web-based email, Skype video conferencing, SNS ⁴⁰ (Facebook, Zazzle, Redbubble, YouTube), the Wii.
Intergenerational Connection	Web-based email, Microsoft Word, SNS (Facebook, YouTube)
Reminiscence and Life Review	Websites, Microsoft Word, SNS (YouTube)
Accessing Knowledge	Websites, search engines, SNS (Zazzle, Redbubble, YouTube)
Maintaining Independence	eBay, supermarket websites, Job Centre Plus and local government employment websites, the Wii.
Creativity	Digital Image processing programs (Paint Shop Pro, PhotoImpact 12, PhotoStudio 5), video editing programs (Ulead Video Studio, Microsoft Movie Maker), the Wii.

⁴⁰ Social Networking Site

On the whole the applications used were similar to those shown in previous research (ONS, 2009; Jones and Fox, 2009) with email and Internet searching predominating. There were some unexpected uses with three of the participants regularly using SNSs (Jeffrey and Sylvia from the Newhaven study and Peter on YouTube) which was unusual for this age group and may represent an emerging trend for more proficient older users. More important than the actual choice of applications was the fact that the establishment of relevance provided a sense of purpose and meaning to ongoing engagement. Given that the learning process for each application was often fraught with difficulty, confusion, frustration and anxiety, having an overarching sense of relevance and purpose allowed new users to integrate these difficult emotions as part of the learning process reframing difficulties encountered as challenges rather than obstacles.

Implicit Learning

Whilst there is a degree to which computer and Internet skills are transferable across applications, each of the relevant applications that users focussed on involved acquiring a specific set of literacies. This progressed in a particular manner for the older computer users. Understandings of computers and the Internet that were present at adoption were often inaccurate or over-simplistic with respect to underlying technical structures. The older computer users tended not to grasp the logical, interconnected and virtual nature of computers and the Internet at first and had not been prepared through prior experiences with similar technology. However such misunderstandings appeared secondary to their particular sense of relevance and purpose with a pragmatic approach being taken to learning how to use particular applications, progressing on the basis of trial and error, discovery and *implicit learning* (Reber, 1989). This allowed those intent on learning to develop adequate skills even without the 'correct' abstract knowledge. Activities with the mouse, keyboard, virtual onscreen representations of words, buttons, Wii controller interactions were all learned and became 'meaningful' through this process of implicit learning whereby embodied actions were practiced repeatedly until they formed a tacit knowledge (Polanyi, 1967) which could then support more intentional activities. Computer interactions enacted through different input mechanisms required different embodied literacies. Those through a keyboard were already familiar to some of the older women but this was a skill that had to be learnt anew for the majority of older men encountered. Other embodied interactions had to be learnt from scratch by everyone. These included using the mouse for virtual control, video and/or sound capture for video based applications such as Skype, YouTube or digital photography websites as well as Wiimote skills using movement capture on the Wii. Each of these skills required its own form of embodied literacy which made reference to coordinated multimodal input rather

than just the textual input of keyboard control. By placing less emphasis on text as an interaction metaphor multimodal interactions supported implicit learning to a greater degree relying on more resilient implicit memory rather than explicit memory capacity (Peters, Hess, Västfjäll, and Auman, 2007). Practice and an awareness of embodied action were important aspects of this kind of implicit learning and the processes of selectivity with optimisation and compensation (Baltes and Baltes, 1990) could also be seen playing themselves out through this kind of learning.

Abstract and Symbolic Learning

Abstract understandings of use lagged behind implicit learning with abstract knowledge about common tasks and procedures within applications only being transferred once implicit learning was well established. Computer and Internet related words and concepts heard prior to use started to acquire a new sense of meaning as a result of this implicit learning. Even keyboard entry of text which could be seen to operate through overt symbolic means involved an element of implicit learning with the changing role of textual language as an 'active' element in operating computers and the Internet particularly in relation to the World Wide Web. Implicit (embodied) and abstract modes of interaction with the technology were reconciled through actual use and ongoing practice as described in figure 32. These meanings were continually transformed through use and interactions with others.

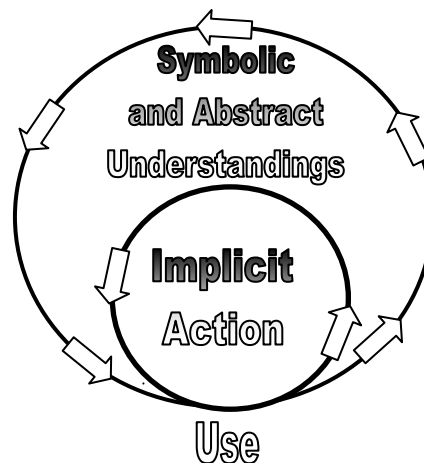


Figure 32: Reconciling implicit and abstract understandings through use

This view of a dynamic process contrasts sharply with the more static views from technology adoption, acceptance and accessibility which emphasise abstract and rational decision making taking place before action. As with sensemaking approaches to appropriation (e.g. Weick, 1995) active learning sees embodied action as the primary interpretive act and abstraction as providing post hoc rationalisations for those actions. A

rich social context was also important during active learning as it provided a source of literate users who could demonstrate and share their own embodied literacy through actual interactions with and through the technology.

Transition -> Development of a Computer-Mediated Presence

Once users had achieved a sufficient competency with embodied literacies through active learning the social potential of their computer and Internet use started to become apparent. This progressed through users developing their own computer-mediated presence which expressed itself through embodied and social performance. This changed the emphasis of interaction from one focused on the technology to one focused on other people and self development. The notion of self emerging here was still embodied but becoming more relational.

Definition of the Computer-Mediated Environment as a Place Rather Than Computer Use as an Activity

At this point there came a sense of *being in* a computer-mediated environment rather than *doing* computer-based activities. When the computer was switched on it created a space for social interactions to take place in. In order to take advantage of this social opportunity the computer was left switched on for prolonged periods or at least regular intervals (as with the Wii). This had a profound impact on the home augmenting it with an ever-present source of social contact. The computer itself started to become a focal point within the home.

Computer Literacy Defined by Self Expression and Social Relevance Rather than Technical Potential

Technical competency was no longer an issue. Users were now beginning to express themselves socially in a way that was in tune with themselves and their audience rather than just the technology. This added another social layer to embodied literacies meaning a whole new set of negotiated meanings had to be learnt or invented through interaction with others. This was most evident in Peter's YouTube conversations. Part of developing this new social literacy was also an ability to traverse different online communication media without losing the thread of activities whether they be creative expressions or social interactions with others.

Supportive Factors:

Social Context of Ongoing Use

A rich social context was important for moving from the active learning phase to deep engagement. It provided opportunities for understanding and learning the social relevance of recently acquired embodied literacies. This depended upon a culture of open sharing and reciprocity where the sharing of knowledge was understood as the currency of literacy and an attitude of empowerment where there were opportunities provided for older people to express themselves through social and embodied performance.

Obstacles to Further Appropriation:

Availability of Technological Function

The basic functions available through the computer depend upon the age of the computer, how it has been set up, the operating system and applications that have been installed on it, the speed of data transfer available through the Internet, etc.. All these elements have a bearing on how an older person will choose to use it and limited technical functionality can negate explorations of the technology's potential. For instance the lack of sound and video capability on the computers at Age Concern meant that no one used it for video-based communication as part of their appropriation of computers and the Internet.

Appropriation Phase 3: Deep Engagement

Definition: The point at which computer and Internet use had been integrated into everyday life and was no longer engaged in as an activity separate from it.

The final phase of appropriation was described by a deep engagement in computer mediated environments and forms of self expression. A minority of the older people encountered throughout the studies had made it to this phase: Sylvia from the Newhaven study, Peter (Geriatric1927) and some members of the Wii team from Sheltered Home 3. The transition to this phase implied a mastery of both the technical, social and embodied literacies underlying specific computer and Internet uses along with a corresponding fluency in terms of expressing oneself through them. In Sylvia's case this was through her exploration of digital photography online, in Peter's through his YouTube vlogging and finally through the digital meeting place created in Sheltered Home 3 by the Wii. Technical interactions had moved even further to the background and become subservient to broader creative, social and transcendent motives reflecting further shifts in self concept. During this phase a sense of ongoing computer-mediated presence had developed with an accompanying sense of involvement and belonging to a particular community of practice. This computer-mediated involvement continued to influence life beyond technological interactions. This degree of engagement also brought with it opportunities for expressing new identities and assuming new social roles and responsibilities.

Definition of the Computer-Mediated Environment as a Meeting Place

With deep engagement came a sense of *ownership* and *belonging* to a computer-mediated environment. When the computer was switched on it created a meeting place where companionship and conviviality were always available. The computer itself had become a place of comfort within the home.

Summary of Full Appropriation Cycle

To briefly recap appropriation has been described as a process of psycho-socio-technical change in which different aspects of the person-technology dynamic are emphasised over time, moving from an engagement defined by the technology itself to one defined by involvement with personal, social and creative endeavours enabled by the technology. This cumulative, developmental movement was described in terms of seven phases: 1) non-adoption; 2) growing awareness; 3) adoption; 4) reframing of purpose; 5) active learning; 6) development of computer-mediated presence and 7) deep engagement. These phases are summarised in the following diagram (figure 31)

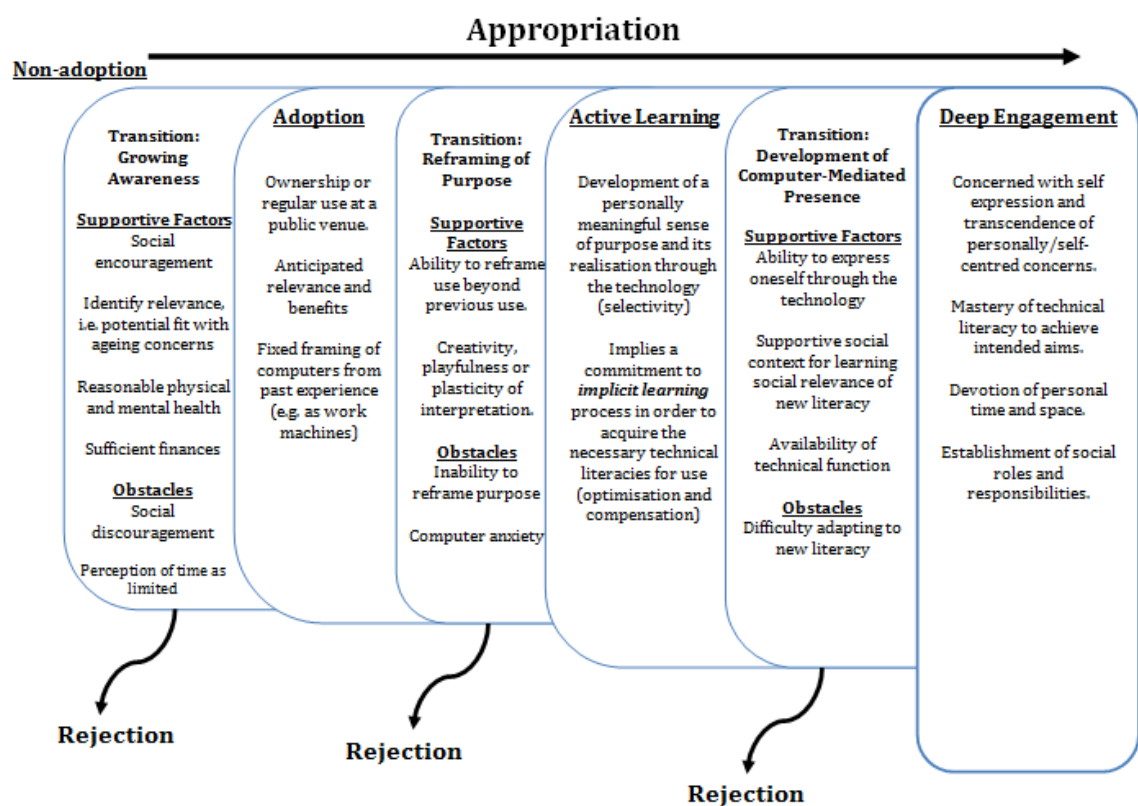


Figure 33: Summary of full appropriation cycle showing supportive factors and obstacles

Prior to and during *adoption* there was an initial assessment of relevance. At this stage psychological preconceptions of use and the effects of social context predominated with physical interactions with the technology appearing only briefly or being vicariously observed through others' use. These preconceptions were ideally reframed after adoption to incorporate new relevancies to motivate ongoing use. During the *active learning* phase physical interactions became central as part of the implicit learning process of establishing technical and embodied literacies with computer input devices (mouse, keyboard, webcam, Wii mote, etc.). The benefits of use were realised during this phase on an

emotional level which countered computer anxiety. Psychological understandings were also revised retrospectively after embodied engagement with the technology. Once a competency with the underlying technical literacies had been achieved their social potential became apparent with opportunities for self expression providing personal meaning. Finally with the accomplishment of social competency within computer-mediated communities of practice brought *deep engagement* and an ongoing sense of inclusion and belonging.

Implications for Support

Outlining older people's appropriation of computers and the Internet as a process of change gives us a way of identifying the factors that are likely to encourage further appropriation during each phase and of targeting support in line with this model. Those who have rejected computers and the Internet will need a very different kind of support to those who have committed themselves to adopting and personally owning a computer and using the Internet. Similarly reluctant adoptees are likely to need very different support to those fully committed to the process of active learning. The developed appropriation model can be used to coordinate support in a manner suitable for each individual rather than using a blanket approach to age-specific instruction.

Approaching support in this way implies an elaboration on the notion of 'warm experts' (Bakardjieva, 2001) extending support to incorporate a 'therapeutic stance' towards older people's use of computers and the Internet which not only accounts for underlying motivational issues before promoting (computer-oriented) changes in behaviour but also directs progress towards self development rather than just technical proficiency. Using models of behaviour change to support users in this way is not a new idea within HCI. The technology acceptance model (Davis, 1989) for instance is based on the theory of reasoned action, a behaviour model developed by Ajzen and Fishbein (1980) to understand how individual attitudes affect consumer behaviour. In chapter 2 the influence of this model in explaining older people's adoption decisions was discussed in relation to computers and the Internet. Other models used in HCI have explicitly focused on supporting behaviour change in technology users with a therapeutic intention. The Trans-Theoretical Model (TTM) of behaviour change (Prochaska and DiClemente, 1986) has been used in eHealth applications to promote healthy behaviours (Norman, Zabinski, Adams, Rosenberg, Yaroch and Atienza, 2007) and has informed the design of energy monitoring technologies to encourage environmentally friendly behaviour (He, Greenberg and Huang, 2010). The

TTM was developed to support Egan's (1975) notion of the 'skilled helper' which explores pragmatic opportunities for supporting personal change in clients through acknowledgment of their relationship to 'change', i.e. it is a model of change that acknowledges the importance of motivation as a starting point for real change. The TTM explicitly deals with the *dynamic* processes of behaviour change as opposed to the event driven model of technology acceptance (Davis, 1989) and through techniques such as motivational interviewing (Miller and Rollnick, 1991) attempts to support the progress of change by acknowledging where a client is along that process and providing appropriate support in lieu of this.

Like the developed appropriation model the TTM sees change moving through a number of phases from precontemplation to contemplation then to preparation, action, maintenance and relapse before cycling round again potentially developing into a progressive 'spiral of change' revisiting the same phases before culminating in the termination of an unhealthy behaviour and the establishment of healthy ones. Figure 32 below compares the TTM with the appropriation model.

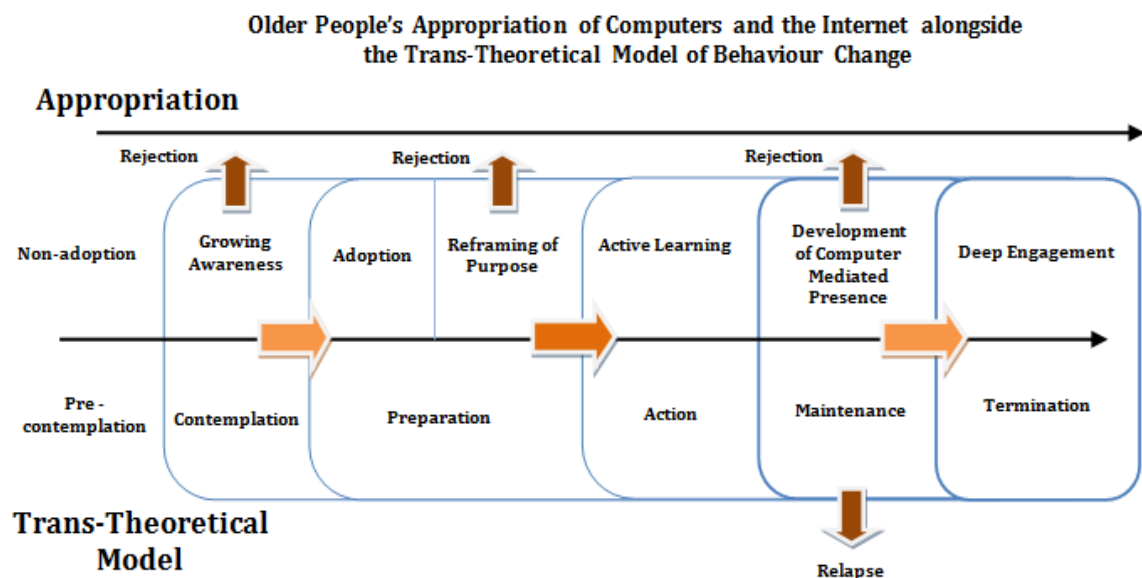


Figure 34: Comparison between TTM and appropriation model

Whilst there are parallels in terms of managing a dynamic process of change there are of course important differences with respect to older people's appropriation of computers and the Internet. Appropriation is not driven by a need to eliminate an unhealthy behaviour nor is it necessarily to instantiate a healthier one. There is no imperative attached to the appropriation of computers and the Internet with older people usually finding solutions to life's dilemmas that do not involve computers. None the less the

technique that underpins the use of TTM and motivational interviewing provides a useful way of implementing appropriation support. The insights gained from years of using the TTM can be helpful when implementing the appropriation support model.

Coordinating Support Through the Appropriation Phases

1. **Non Adoption:** at this pre-contemplation stage users are not yet interested in adopting computers and the Internet. Awareness of their potential will be limited and they are likely to have preconceived notions about their purpose. Establishing a rapport with the prospective adoptee by seeking to understand their life and personal interests is the best way to provide support at this point
2. **Growing Awareness:** here potential adoptees will have started to consider using computers and the Internet. Support at this point involves raising awareness of the possibilities for computer and Internet use and their potential relevance to individual users. Using examples of other older 'lead users' as role models may help to demonstrate the six core themes. Opportunities to try out Internet connected computers before committing to a purchase or regular attendance at a public venue are also an important precursor to adoption. In the UK events such as the annual Silver Surfers' Day currently serve this function.⁴¹
3. **Adoption:** early encounters with computers and the Internet are pivotal in shaping the later appropriation trajectory, providing the stimulus to move from thinking about their potential to actually trying it out. Pragmatic support must be given at this stage in terms of guidance on basic functions (e.g. how to turn the computer on and off, the purpose of the mouse and keyboard, etc.) as well as information on purchasing or accessing equipment and an Internet connection. Given the problems of computer anxiety that are likely to be present at this stage it is important that those involved in presenting the possibilities are trusted by the new users. Other forms of social and technical support within that person's life (i.e. friends and family who are online) should be identified.
4. **Reframing of Purpose:** after the decision to adopt a computer and use it on the Internet either by purchase or regular access there is a short period of trying out

⁴¹ This is a national ICT taster day specifically for older people funded by Digital Unite in conjunction with libraries, community centres and voluntary organisations such as Age Concern across the UK. See <http://silversurfers.digitalunite.com/>

the different ways in which they could be used and of validating these senses of purpose in relation to their own life goals. This is a period of imaginative exploration before settling on a particular purpose. Support here involves trying out alternative uses for computers and Internet beyond work-based notions and encouraging an attitude of playful exploration. Different applications in relation to the six core themes of relevance can be suggested and explored in relation to the specific needs of each user. At this point social contact should be initiated online with friends and family by exploring the use of different social media (email, instant messenger, Skype, SNS, etc.). Early use of media incorporating multimodal communication should be encouraged as this supports greater intimacy.

5. **Active Learning:** this is a period of committed engagement with the technology and of confirming its ability to bring added value and meaning to an older person's life. This is a painstaking process of learning how to use particular applications and of acquiring the necessary embodied literacies. This takes time and means establishing regular practice and finding ways of overcoming age-related obstacles through compensatory methods. Typically the learning process is characterised by confusion and frustration early on which can challenge motivational resources. In terms of support the most important thing at this stage is to maintain a high level of motivation incorporating online social contact (i.e. close family and friends) or other notions of relevance as central to the learning process. Extended projects should be suggested that explore the six core themes of relevance more fully. These need to be negotiated in relation to the users for each theme and will mean engaging in different kinds of activities for different users. Practice of embodied skills is essential for establishing competence. Whilst this can be done for short bursts through suggested meaningless tasks there must be an overarching purpose which is always clear and meaningful.
6. **Development of Computer-Mediated Presence:** competency with particular applications has been established at this point and the social aspects of computer use are only beginning to emerge. There is a growing awareness of the social mores of particular online social contexts and opportunities for self expression within these contexts. This is about a literacy of the self (rather than the technology) in relation to particular chosen communities or significant others. Support at this stage is about highlighting the social meaning of computer-mediated activities and of exploring opportunities for self expression, ideally with

the support of online family and friends but not limited by this distinction. The scaffolding related to technical literacy can start to be removed.

7. **Deep Engagement:** here the enduring benefits of computers and the Internet have been realised. Described in terms of the overall process of change as 'the new normal' (Young, 2009). New social roles have been established and are characterised by new duties and responsibilities. With this come new personal connections, feelings of intimacy in communication with family and friends and a sense of belonging to a community. This degree of engagement with computers and the Internet speaks for itself. There is less of a need for external support here and it is important that an empowering attitude remains central to support removing scaffolding when independence is achieved.

Implications for Accessible Design

Understanding appropriation in terms of a process of change also gives a view into the development of users' competencies over time and what factors can support this. The role of design will now be considered in terms of how it defines the person-technology dynamic by changing expectations at the interface. Following a successful appropriation interactions at the interface are defined predominantly by a period of open exploration of socio-technical possibilities (adoption and reframing of purpose) then a learning phase in which embodied technical literacies are acquired (active learning) and then finally a period of developing the socio-technical skills for deeper social engagement (development of computer-mediated presence and deep engagement). Each of these periods: interpretation, learning and social engagement builds upon the previous one and they are all important to address at the interface if appropriation is to be encouraged. Each of these periods will now be considered in turn.

Interpretation

Computers are highly configurable general purpose machines which means that they are apt to be appropriated in numerous and idiosyncratic ways with various interpretations of relevance and purpose. Some of the older users in this thesis did become more open to new interpretations of computer use beyond adoption. Computer applications can encourage or negate opportunities for 'open' interpretation by allowing various degrees of personalisation, user defined function and opportunities for social interaction. Current approaches to accessibility (as in 'Design for All', inclusive or universal design) seek to simplify, standardise and limit interpretations and the breadth of possible interactions

through design in order to make technologies more universally accessible. However this approach can also inhibit appropriation by assuming an established prior use for the technology and static models of the older user. Approaches to accessibility that attenuate to the user (i.e. user sensitive inclusive design, universal usability or universal accessibility) allow a staggered range of interactions in line with different user competencies but must still provide a restricted subset of functionality at each stage on the basis of similar static models of an older person. Whilst such adaptive approaches to accessibility would suggest an affinity with appropriation because they accommodate developing competencies the findings also show the centrality of interpretation in guiding the older users' computer and Internet based adaptations towards effective and meaningful use.

Accessible designs must retain opportunities for older people to make their own sense of computer and web-based applications so that they continue to motivate meaningful engagement for each individual. This means not oversimplifying interfaces or restricting functionality but retaining elements of ambiguity and complexity which allow the user to interpret their own sense of relevance and purpose with the technology (Gaver, Beaver and Benford, 2003; Sengers and Gaver, 2006; Kelly et al., 2007). However whilst ambiguity is important to retain it is unlikely to promote older people's appropriation of computer-based technologies by itself and is just as likely to leave naïve older users in a state of frustration and bewilderment when using the new technologies on their own. In this thesis the importance of the social context was evident in validating alternative uses during initial encounters with computers and the Internet and of fostering an exploratory attitude which allows users to derive their own sense of purpose in the face of ambiguity and to construct meaning with others. This suggests that ambiguity is more likely to be appreciated either when it is made explicit by the application or by those supporting its use.

The overriding principle here is of empowering older users to be in control of their own computer and Internet use. What this also means for interface design is that changes relating to accessibility measures should always remain under the control of the user as suggested by universal usability (Schneiderman, 2003) if they are to foster appropriation. Dourish (2003) takes this notion of user-centred adaptation one step further by suggesting "composable functionality" (ibid; p. 482) as a support for appropriation by allowing incremental customisations to a computer application's behaviour at a deeper level than just at the interface. In order for such approaches to also be accessible to older users they would have to understand the implications of such customisations and to

represent them in ways that were transparent to those supporting them if they were to learn how to make use of them. This would place an older user closer to the role of designer but returns us to one of the insoluble problems of accessibility and indeed HCI, that of translating a designer's logic into an immediately understandable form for all other users at the interface. As Dourish also points out this is something which is usually resolved through social practices rather than purely by the technology. This thesis has shown that similar problems of unanimous understanding in relation to mainstream computer applications were resolved by older computer users through conversations with support staff, friends and family and through experimental use and discovery.

Learning

Static models of the older person that exist in current accessibility measures anticipate either no development in terms of competency (as in 'Design for All', inclusive or universal design) or staggered development that is based on a rational progression of skills and knowledge (as in user sensitive inclusive design, universal usability or universal accessibility). The evidence in this thesis suggests that neither of these models account for the learning seen during appropriation. The phase of active learning was characterised by an experimental, discovery-based approach which progressed through implicit learning techniques rather than through the rational accumulation of abstract knowledge.

The implicit learning that took place was largely incidental, taking place without understanding. This should be taken as the primary model for older people learning to use computers, the Internet and the applications therein. It is clear that symbolic communication was more of a challenge for the older people in the studies and implicit approaches were deemed to be more pragmatic when using computers and the Internet for the first time. To support this through design there should be built in practice opportunities as part of beginning to use new computer applications. This would mean an initial 'sandpit' where applications could be used without any real effect. Once new users start to use the application with reasonable competency there should be a means of replaying onscreen actions to reinforce implicit learning, i.e. it is enactment of sequences that is important in terms of learning functionality rather than abstract information about those functions.

Social Engagement

Current models of accessibility are unable to accommodate the way that social context comes to influence ongoing interactions with computers and the Internet (Kelly et al., 2007). Whilst this comment relates to both offline and online forms of social contact it was

the online social context of certain web 2.0 environments (YouTube for Peter, Redbubble and Zazzle for Sylvia) that proved to be particularly transformational for the deeply engaged computer users in this thesis. Current accessibility measures struggle to deal with such environments (Kelly et al., 2007) where user-generated content usually pays no heed to accessibility standards. There is now growing concern that these accessibility issues will create a further digital divide between passive consumers of Internet content and those who produce or co-create it (Brandtzæg, 2007; Karahasanović, Brandtzæg, Heim, Lüders, Vermeir, Pierson, Lievens, Vanattenhoven and Jans, 2009). To the contrary this thesis would suggest that web 2.0 environments provide social opportunities for older users to resolve accessibility issues. The existence of online decorum in these environments gives older users a means of resolving issues of shared interpretations for computers and Internet use and the availability of technically literate others on these websites provides opportunities for resolving misunderstandings that aid learning. In addition the opportunities for social and embodied performance as part of involvement brings previously inaccessible avenues for self expression and social inclusion. It would make sense to make such Web 2.0 environments more immediately available to older users as soon as they start to use computers and the Internet (i.e. at adoption). This would encourage appropriation and access because of the social opportunities they afford.

Summary

In this discussion appropriation was described as a process of change developing over time with each phase describing the evolving person-technology dynamic. The implications of this process model were also considered in terms of providing appropriate support to older computer users through a therapeutic stance that promotes well-being. Finally implications of this same process model were considered with regards to accessible design. The next chapter will draw together final conclusions from all the findings and suggest directions for future research.

Chapter 11 – Conclusions and Future Directions

Covered in this chapter:

In this chapter the thesis is concluded by presenting the main contributions of the thesis and proposing future directions for research building on an appropriation-based approach to accessibility.

Computer and Internet Appropriation as a Positive Adaptation to Ageing

This thesis started by noting some significant trends in developed societies. The increasing age of populations in the developed world, the potential of computers and the Internet to enhance older people's experience of growing older in these countries, the poor uptake of these technologies amongst the older generation and the inability of current accessibility and adoption measures to address meaningful use for this demographic. These trends have become of growing concern in the developed world where the Internet has rapidly become a vehicle for distributing the benefits of civilised society and where digital inclusion has become synonymous with social inclusion (EC, 2007; Department for Communities and Local Government, 2008a). Research addressing the digital inclusion of older people has highlighted the importance of understanding the process by which older users establish the relevance (Selwyn et al., 2003; Dickinson and Hill, 2007; Richardson et al., 2005) and benefits (Sharit et al., 2004; Melenhorst et al., 2001; Melenhorst et al., 2006; Department for Communities and Local Government, 2008a) of these technologies in their everyday lives. In this thesis the theoretical lens of appropriation has been used to examine relevance and benefits as aspects of the person-technology dynamic in terms of a psycho-socio-technical process of change which can accommodate positive and adaptive responses to ageing.

One of the major contributions of this thesis has been to show how older people's appropriation of computers and the Internet is driven by 'positive adaptations to ageing'. To put it another way, the relevance and benefits of these technologies are assessed in terms of whether or not they support age-relevant and life affirming motivations. This

challenges current conceptions of accessible design which define older people in terms of their functional deficits and ignore the motivations and adaptations that are relevant to individual experiences of ageing.

As ageing populations increase worldwide (UN, 2007) it is likely that developed nations will turn more to computer-based technologies to deal with anticipated increases in health and social care demands. Such measures will run the risk of disempowering older people if they maintain a deficit-driven approach to design. Already computer-based systems are being introduced into the homes of dependent older people as part of care initiatives to support independent living or 'aging in place'. At the same time developed societies are placing increasing emphasis on online forms of access to information, goods, services, entertainment and culture (EC, 2007). If current approaches to accessible design for older people are not expanded to include their adaptive capacity they risk sidelining them as passive recipients of those same computer-based services and excluding them from broader social involvement.

This thesis has shown how the relevance and benefits of computers and the Internet are judged not in terms of functional deficits but in terms of the positive adaptations that they enable. The developmental theories of Erikson (1963), Baltes and Baltes (1990), Carstensen (1992) and Tornstam (2005) have been useful in framing computer and Internet appropriation in terms of ageing adaptation. This synthesis of appropriation and adaptive ageing theory is a unique approach to understanding older people's relationship to computer technology which acknowledges their adaptive capacities.

Selectivity with optimisation and compensation (Baltes and Baltes, 1990) was shown to influence initial identification of computers as being relevant (through selectivity) as well as informing adaptations during the learning process (in terms of optimisation and compensation). Socioemotional selectivity (Carstensen, 1992) and gerotranscendence (Tornstam, 2005) were shown to influence appropriation by dictating choices in terms of social media and sources of social contact. Erikson's (1963) approach to reminiscence and life review in later life was also evident in some of the participants' reflective uses for computers and the Internet.

Appropriation, as used in this thesis, describes the process by which older people establish the relevance and benefits of computer and Internet use in everyday life. As such it has shown relevance and benefits to be fluid, negotiated and relational qualities determined by ongoing personal development in relation to computer technology and the emerging social context of use, i.e. they are accomplishments of older people's computer and

Internet engagement. Currently approaches to encouraging adoption of computers and the Internet amongst the older population suggest that the 'problem' of non-adoption can be solved by merely making older people more aware of pre-existing benefits of these technologies (Sharit et al., 2004; Melenhorst et al., 2001; Melenhorst et al., 2006; Department for Communities and Local Government, 2008a). The findings from this thesis suggest that the relevance and benefits of these technologies need to be discovered, created and established through actual use over time for each individual to maintain meaningful engagement. There does not appear to be such a thing as a generic benefit for older people using computers and the Internet. Potential benefits must be addressed individually as part of a supported and negotiated process of appropriation. Empowering older people to take the initiative and control in defining the meaning of such technologies is partly dictated by design but also by the social processes that surround the appropriation process.

Appropriation-Based Accessible Design for Older People

This thesis proposes a new approach to accessible design for older users which uses appropriation as a way of achieving greater inclusion. This approach seeks to acknowledge the significance of positive adaptations to ageing at an early stage in the design process and to harness them as motivational resources. In this thesis this has been done by identifying six 'core themes of relevance' which represent age-relevant motivations intrinsic to older people's appropriation of computers and the Internet. Designs based on these motivational themes will emphasise the ongoing process of self development and empowerment that needs to be present if designers are to sustain further appropriation amongst older users. This appropriation-based approach to accessible design is also presented in terms of an 'ecology of access' showing the complementary nature of such an approach in relation to deficit-driven approaches. Here access to meaningful experience (in terms of the core themes) is presented alongside access to functionality (the current approach to accessible design).

Appropriation-Based Support for Older Computer Users

Another significant contribution of this thesis is to propose a structured way of supporting older people's appropriation of computers and the Internet. Here appropriation is presented as a cumulative developmental opportunity for older people in which different aspects of the person-technology dynamic are emphasised over time, moving from an

engagement defined by the technology itself to one defined by involvement with personal, social and creative endeavours enabled by the technology but remaining relevant to ageing experience. Specific phases are identified as indicative of appropriation and as a guide for supporting it. These are: 1) non-adoption; 2) growing awareness; 3) adoption; 4) reframing of purpose; 5) active learning; 6) development of computer-mediated presence and 7) deep engagement. According to this model, motivational support can be provided by ascertaining where along the appropriation continuum a user is and tailoring support in tune with this phase.

The Computer-Enhanced Experience of Ageing

This thesis also contributes to understandings of contemporary ageing, highlighting the ways that computer and Internet appropriation can reshape the experience of ageing offering previously inaccessible opportunities for social contact and self development to otherwise housebound and socially isolated older people. This was most pronounced amongst the deeply engaged older users in this thesis with them exploring opportunities for greater social engagement and self knowledge through new 'public' roles in online communities. Even with less engaged users the acquisition of new forms of socio-technical communication practices still lead to opportunities for greater social inclusion with family and friends sometimes accompanied by greater self expression, intergenerational understanding and increased social confidence. For all users the acquisition of new embodied literacies associated with computer and Internet use provided opportunities for greater functional adaptation and independence.

Whilst it should not be assumed that all computer and Internet appropriation will be positive, or indeed that it is the only possibility for ongoing development, the examples in this thesis do invite a re-examination of existing ageing theory to accommodate the developmental opportunities that now seem to exist through computers and the Internet. Some of the normative views perpetuated by certain ageing theory no longer seem to hold sway with these opportunities offering new avenues for ageing experience. For instance Erik Erikson's notion of life review as the final consolidating act of old age does not seem to fit with Geriatric1927's experience of YouTube. His life review came to an end but spawned new forms of self expression suggesting the possibility of further life stages in old age than those envisaged by Erik Erikson. This possibility for ongoing development in later life is of course something already acknowledged in this thesis in terms of gerotranscendence (Erikson and Erikson, 1998; Tornstam,2005). Tornstam (2005) suggests that opportunities for gerotranscendence are partly due to the extended life

spans now common in developed societies. This thesis suggests that computer-based technologies also have a role to play in supporting this process.

Carstensen's (1992) socioemotional selectivity theory also needs to be revised in light of these new computer-based social opportunities. Whilst socioemotional selectivity was present in many examples of adoption in this thesis it was not a predominant aspect of deep engagement where emotional management was less of an issue and social engagement with unknown others was an intrinsic part of participation. This suggests that socioemotional selectivity may actually reflect a socio-cultural bias in terms of the social expectations associated with ageing rather than being about ageing per se.

Limitations of the Research

This thesis has taken a qualitative and ethnographic approach to exploring older people's appropriation of computers and the Internet. As such the findings are interpretive and will lack generalisability beyond the study settings. In addition the grounded approach used defined a particular route to investigation which inevitably emphasised some aspects of the person-technology dynamic over others. It is possible that other researchers would have emphasised different aspects of this dynamic or that another sample of participants would have presented older people's emerging relationships with computers and the Internet in a different light. In particular this thesis has elaborated the social potential of computer and Internet appropriation particularly through multimodal opportunities. This could be criticised for portraying appropriation as a fairly linear process developing in terms of increasing social engagement when in fact it is a deeply idiosyncratic one. The social aspects should not be taken as an inevitable aspect of all appropriations but rather just one route for appropriation. For instance it is possible that a more detailed analysis of other themes of relevance (e.g. creative uses of computers taking place in isolation such as Geriatric1927's video making) would have yielded quite different descriptions for appropriation.

The samples used for the studies also have implications for the generalisability of the findings. The majority of participants (except for Peter Oakley) were drawn from the South East of England making it unrepresentative of other parts of the UK or other countries. This presents a specific bias in terms of the demographic of this area. In addition no distinction was made between different cohorts within the samples, i.e. between the younger-old and the oldest-old. It has been argued that the younger-old have a greater familiarity with computer technology from their working lives and are likely to

adjust to using it more easily (Hill et al., 2008). However the emphasis in this thesis has been on the relationship between older people and computers and the Internet as a result of adaptive ageing rather than considering changes in functional abilities. Other studies have shown adaptive ageing processes to be fairly consistent across cohorts (Melenhorst, 2002; Tornstam, 2005) so they were not considered in this thesis but may be something worth exploring in further research.

Finally the studies that informed this thesis made a deliberate attempt to engage with older computer users who were already using computers and the Internet in some way with a particular examination of deeply engaged 'lead users' (Von Hippel, 2005). Whilst this was done deliberately to focus on motivational issues that were under explored in current accessibility measures this will inevitably have created a sample bias towards self selecting motivated individuals.

Despite these misgivings this thesis offers significant value in providing a critique to current accessibility models and opportunities for rethinking approaches to design for older people. It also shows the continuing value of HCI theorists establishing dialogues with other fields of research in this case that of developmental lifespan theories of ageing.

Future Research

In this thesis six core themes of relevance were established as a basis for older people's appropriation of computers and the Internet, outlining appropriation as a process model of change which develops through specific phases over time and which can be supported appropriately in accordance with these phases. It would be important to test the validity of this model with older individuals who were not obviously motivated to use computers and the Internet, i.e. current non-adoptees, particularly aiming for those older people who are most isolated and vulnerable and where the risk of social (and digital) exclusion is most evident. This could take place in conjunction with the development of a specific training program for computer facilitators which would use the appropriation-based therapeutic approach to support.

It would also be interesting to see how well this appropriation model generalises to other populations not included in the thesis using groups of older people from different locations in the UK and other countries. It would be interesting to see whether for instance the core themes of relevance, which appear to be responding to changes in developed society, translate to developing countries as well. In a similar vein it would be interesting to see how the appropriation model translates to other technologies that have not been

considered in this thesis but which are significant to older people in other cultures or locations, such as the mobile phone, digital TV, etc.

Finally it would be worth exploring the potential of emerging technologies for 'fast-tracking' older users to successful appropriation of computer-based technologies by giving them immediate access to social and embodied performativity as the primary form of Internet-based interaction. This would mean incorporating technologies such as web 2.0 and embodied interfaces such as the Wii as part of a research agenda focused on *appropriable design*.

Concluding Remarks

In this thesis an ecological view of access was outlined and an appropriation model of psycho-socio-technical development which maintains an empowering approach towards older people and their use of computers and the Internet. This could be used as a basis for developing future computer-based systems which promote older people's creative engagement in life and society. Insights gained in relation to empowerment principles such as the focus on 'positive' ageing as a motivation for design and the emphasis on social and embodied performativity as a source of empowerment could aid in the future development and acceptance of such systems. For such an empowering approach to take hold amongst service providers and designers of computer systems there would also need to be a broader shift in values to a point where ageing was appreciated as an opportunity for fulfilment rather than just as an inevitable process of decline and where old age itself was recognised as an achievement; its virtues relevant to us all.

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APPENDIX A

Interview Guide for the Newhaven Study

1. Experience of life since retirement: How do you feel your life has changed since you retired? How do you spend your time differently?
 2. Experience of ageing:
 - a. Social changes
 - i. Isolation/loss of family, friends?
 - ii. Developing relationships/family connections?
 - b. Everyday activities
 - i. Mobility changes/illness?
 - ii. Change in choice of activities?
 - c. Change in personal perspective/attitudes?
 3. Have computers and the Internet played any role in your life since retirement ?
 - a. Other technologies? Mobile phones, etc?
 - b. Prior experience with computers ?
 - c. How long ago did they start using ?
 4. What effect have such technologies had on your life ?
- If computer user:
5. What do you use your computer for ?
 6. Where does it live in your home?
 7. What is your experience of using the computer like?
 - a. Enjoyable/frustrating/?
 - b. Productive/creative/?
 8. Has it affected your communication with others?
 9. Pros and cons of computer ownership and use ?

APPENDIX B

Example of Coding for Newhaven Study

(coding key contained within comments)

D: So RedBubble's different because it has that kind of social interaction?

I: Oh it's very socially interactive. Now this is marvellous for lonely people because even if you're not a very great photographer you can soon learn and people will help you and if there's anybody ever that in this local area wants to, you know older people want to join, you know if they get in touch with me when they get on RedBubble I'll show them around and help them you know what to do because it's a bit, it is daunting especially if you're not very... I'm very adventurous and you know I'll try anything and I can find my way around but other people may not have quite so much ability perhaps but then I mean I must say ability comes with working on things.

Comment [D H1]: Appropriation of computers and the Internet – learning process -approach to learning

D: Yeah and sometimes with other people

I: Yes because I mean I've been in a state because of isolation where I couldn't hardly speak on the phone and I'd avoid people every time I see them you know because you lose. If you get isolated you lose your social skills and you don't have the confidence to speak to people and then because your life is so shut in you don't have anything to speak about and I think that's often the trouble when older people meet. Unless they have interests and things, they spend their time talking about their ailments, you know and things like that and it's very, it's not at all, it's very depressing. So it's very important I think for older people to try and find some outlet, something interesting, trying... maybe they never drew anything in their lives, get some coloured pencils and try doing something. You know maybe they never wrote a poem in their lives, you know could I write a poem? sit down. Maybe they never wrote anything about anything. Well sit down and write something about your experiences, about your memories from the past because you can do writing and put it on RedBubble as well too

Comment [D H2]: Experience of ageing - social isolation (projected onto others)

D: Oh right

I: Because I know there's one lonely chap on RedBubble and he is, he was a carer for years of his elderly mother, finally she passed on, he's very lonely on his own. He had a lovely, a dog, his dog has now gone and he's, you know he's finding life very tough. So he's on there and it gives him a little bit of social, there's another lady and she's a carer for her husband. He's in a very poor condition and she has a tough life and she looks quite elderly from her picture and I've tried to encourage her. I've put her on my watch list and try and send her some mail, you know encourage her. A lot of her photography wasn't very good to start with but she's learning how to make designs and things like that with photographs, with a photo editing programme, which doesn't have to cost too much and you can do marvellous things when you get to... but I think, I mean the more you learn the more you can learn because I think when people get really

Comment [D H3]: Appropriation of computers and the Internet – reasons to start using computers/adoption - meaningful engagement -sense of purpose- creativity

Comment [D H4]: Appropriation of computers and the Internet – sense of purpose: social contact

Comment [D H5]: Appropriation of computers and the Internet – learning process?

seriously elderly and find difficulty with learning, it's probably... after they retired they never really kept challenging themselves or learning new things. Lifelong learning, I believe in it. It's important because it keeps... the more you learn the more your ability to cope with learning increases.

Comment [D H6]: Experience of ageing
- self challenge

D: So if you can introduce people who have retired, people who... like the people that you're talking about, people that are maybe socially isolated or lack confidence. If you were going to introduce them to computers, how would you start? What kind of things would you...?

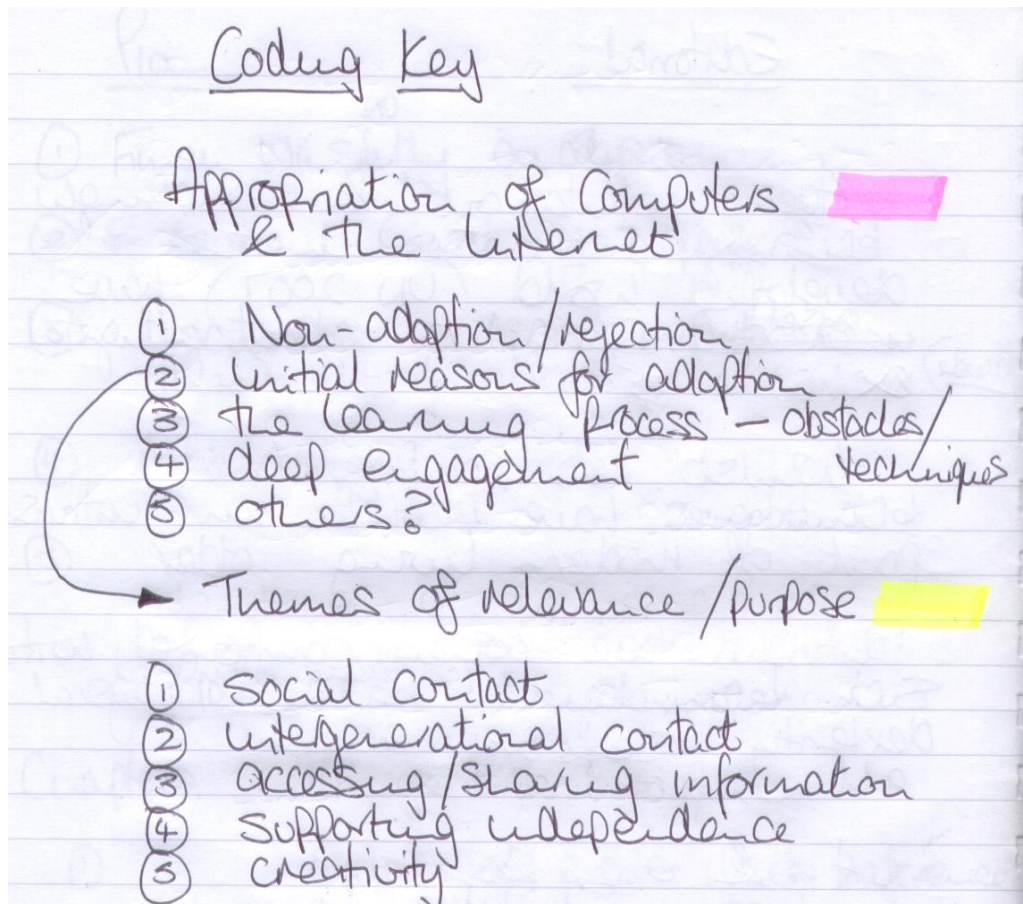
I: Well first of all I would start by, I would really want them to have somebody... now I mean if I was there to help them everyday ok or to help them when they needed it, it wouldn't be so bad but I do think anyone who's contemplating having a computer needs either some family. I mean I think a lot of older people have children, you know in their, I mean grandchildren or that in their lives who would come and help them with their computer and maybe it motivates people to have a computer if they think they can do things with their grandchildren, but if you haven't got any grandchildren or you haven't got any, I mean some people just don't have anybody much and when you get to be really old, maybe you really don't because maybe either your friends have gone and you're, you know you might be really quite isolated. Now that's seriously difficult so I think the first thing before anybody starts thinking about a computer, they really do need some support. This is why I would like to see more support for computer users and the first thing I would do to introduce a person to computers is I would sit down and really chat to them about the good things that they could do if they had it. I would like to find out what their interests were, what they would like to do and then I could find out whether they really would be, you know whether they would benefit from a computer or not. Have they ever used anything like that? Have they ever used a typewriter? because of course I mean if you've never even used a typewriter, you know you've got to learn, you need basic skills of you know just sort of writing letters and things like that using the keyboard and if you've never done anything like that, it is much more difficult, but I would like them to be able to get a taster and have a computer on loan, maybe for free, set it up. I could do something simple and have somebody come round and let them try it and see how they got on with it, because it's a bit difficult to say to an older person 'well you know you'd do well with a computer, get a computer and they get a computer and they can't cope with it and then they've bought a computer you know.

Comment [D H7]: Appropriation of computers and the Internet – adoption - importance of intergenerational connection - social support

Comment [D H8]: Appropriation of computers and the Internet – adoption - previous experience with technology

APPENDIX C

Coding Key and Example Coding for Observations at the Age Concern IT Drop-in Centre



25th April 2007, Age Concern

Ivy

- Still confused about her username / password and getting quite paranoid about volunteers being able to access her files (2) + (3)

Patricia

- New to computers but ^{Prior experience} had been a Secretary for 40 years. Still uses her typewriter every week writing short notes to friends in her retirement flat where she is chairman (?) of the residents association. (2)

She wanted to view the new plans for BtHsvic college which a friend had posted out on the web. We got to that eventually but Peggy really struggled with the mouse. Found the keyboard controls much easier. (2) + (3)

(3) Was excited about "email" & "the internet" but not quite sure how that fitted with typing letters. - We started a letter in word & Peggy said "but how do I get the paper out of here" (pointing at the computer screen). The notion of a separate printer was also puzzling - how did the documents

gets to the printer

Betty

- ① - Enigil. She had received an unusual response from an email server suggesting an email had not been sent. She wanted to resend it. I showed her how to copy & paste which she thought was really impressive - retrieving words from the ether.
- ③ - She then wanted to look up thyroid problems on the internet - her doctor had told her she needed surgery but she wasn't convinced. She found medication was available for hyperthyroidism.

③ 2nd May - Age Concern

Dorothy

- ①+② - Very keen 84 y/o. She had written a story for her neighbours children - one 2 years old, the other 3(?).
- ③ - She wanted to type it out in word and send it to her friends (and neighbours) by email as an attachment - killing 2 birds with one stone - learning about email/computers & giving a story to

APPENDIX D

Interview Guide for Peter (Geriatric1927) - August 2007

1. I'd really like to understand the journey that you have made to using YouTube - how did you acquire the skills and what motivated you to do so?
 - a. Time taken?
 - b. Past experience?
 - c. Other interests?
 - d. Relevance to ageing?

2. What advice would you give to other people of your age if they wanted to start with computers and the Internet ?
 - a. Learning process?
 - b. Obstacles?
 - c. Techniques used for getting to grips with computers?

3. Now you are famous on YouTube and you have all these different ways to communicate with people, how has it affected your social life?
 - a. Friends and family contact online?
 - b. How have your relationships with your YouTube friends developed. What is it about people and the videos/messages they send that means that an online friendship develops?

4. What do you think it is that your younger viewers like about you and your videos?
 - a. Intergenerational issues/ageism?
 - b. Qualities of fulfilling intergenerational contact?

5. Do you think there are ways that YouTube could encourage intergenerational contact?
 - a. Design considerations?
 - b. Social organisation/ YouTube community?

6. How do you decide what you are going to make your videos about ?
 - a. Ongoing learning process
 - b. Sources of inspiration?
 - c. Social conventions on YouTube

APPENDIX E

Interview Guide for Peter (Geriatric1927) – January 2010

1. How Peter's YouTube use has developed over the past 3 years?
 - a. Peter's interpretation.
 - b. Appropriation over time?
 - c. Relevance to adaptive ageing?

2. Revisit the learning experience: What are the main things that you have learnt during this period? (relate to Age Concern experience)
 - a. Obstacles?
 - b. Role of practice?
 - c. Specific skills and knowledge?
 - d. Social support?
 - e. Approach to learning

3. Social Impact: How would you describe your attitude towards meeting new people online?
 - a. Socioemotional selectivity ?
 - b. Intergenerational attitudes?
 - c. Role of intimacy?
 - d. Family involvement ?

4. Retrospective look: How do you think your role has developed on YouTube over the last 3 years?
 - a. How do you think your video making has developed in that same time?
 - b. Are they related?
 - c. Go through genre analysis with Peter
 - i. Test videos
 - ii. Reminiscence and life history
 - iii. Reflections on modern life, news or world events
 - iv. Promoting older people's involvement in modern culture
 - v. Personal reflections on everyday life and the experience of being 'old'
 - vi. Advice or educational content
 - vii. YouTube related
 - viii. Filmed naturalistic events
 - ix. Readings or scripted performances

5. Could you explain how your experience of making videos now?
 - a. Feeling towards the YouTube community?
 - b. Feelings towards obligations/responsibility?
 - c. Other feelings?

APPENDIX F

Interview Guide for Age Concern Organisers

Initial Motivations

- Why did you decide to invest in the Wii for Age Concern Brighton ?
- How many Wii events have you done so far ?
- How many people attended these events ?
- Where did they take place ?
- Do you know how far people came to take part in them ?
- Why do you think people came to these events ?

People's Attendance

- What were the most important things for you to get right on the day ?
- What did people do while they were watching or waiting to have their turn ?
- Did they need much encouragement to join in ?
- Did people give reasons for not joining in ? If so, what were they ?
- Did you have any health and safety problems present themselves during these events ?

Game Play

- What tactics did you use to engage new players in the game ?
- What games were the most popular ?
- What were the main problems that people encountered when playing the games ?
- Did they have any problems when using the Wii controller ? If so, what were they ?
- How important do you think the following were:
 - Meeting other people whilst playing the Wii
 - Playing the game
 - Mastering the controls
 - Winning

APPENDIX G



University of Sussex

Dave Harley

Interact Lab

Department of Informatics
University of Sussex
Falmer, Brighton
BN1 9QH, UK

Study: Using Computers and the Internet in Later Life**CONSENT TO TAKE PART**

I agree to take part in the above research project.

I have had the project explained to me and I understand that agreeing to take part means that I am willing to be interviewed by the researchers.

I have/have not agreed to that interview being recorded.

I may be invited to take part in further interviews.

I understand that any information I provide is confidential within the research team. No information that I provide will lead to the identification of any individual in the reports on the project, either by the researcher or by any other party.

I understand that my participation is voluntary, that I can choose not to participate in part or all of the project, and that I can withdraw at any stage without being penalised or disadvantaged in any way.

Name: _____

Signature _____

Date: _____

APPENDIX H



Dave Harley

Interact Lab

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University of Sussex
Falmer, Brighton
BN1 9QH, UK

Information Sheet for Research Study: Using Computers and the Internet in Later Life

Hello,

My name's Dave Harley and I'm a research student at Sussex University. I'm currently doing a study looking at how people make use of computers and the Internet once they've retired. I am also working here as a volunteer hoping to find out how people make sense of computers and the Internet at the same time as help you to learn about how to use them. In particular I'm interested in finding out about your attitudes towards computers and the Internet and learning about how you actually use them. Do you use email, the Internet or particular websites or programs. Do you like them, do you avoid them? How did you first find out about them? If you do use computers and the Internet how did you go about learning about them? What have you found easy to learn, what difficult?

Taking Part in the Study:

If you do not wish to be part of the study in any way just say so and I will not include any of your comments. If you are interested in being further involved in the study we can arrange a short interview where you will get a chance to tell me about your experiences with computers and the Internet.

Confidentiality:

Although I will use the interviews in my studies, everything that you say will be kept confidential and your name will be changed in any reports or written documents to maintain your anonymity. Only I and my supervisor will ever have access to the data.

Further Information:

If at a later date you would like further information on this research please contact: Dave Harley, tel: (01273) 643472